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July 30/95.

F. J. Shaw
Genl. Secy.

Med
V

TRANSACTIONS

OF THE

VERMONT

STATE MEDICAL SOCIETY

FOR THE YEAR 1894.

PUBLISHED BY THE SOCIETY.

Annual Meeting in 1895 at Burlington, Oct. 10 and 11.

NOTE—Each article published herein, stands upon its own merits as the expression of its authors' opinion, for which the society does not hold itself responsible.

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1894-95.

J. H. LINSLEY, *President*.....Burlington.
F. F. CHAFFE, *Vice-president*.....Hartford.
D. C. HAWLEY, *Secretary*.....Burlington.
D. G. KEMP, *Treasurer*.....Montpelier.
HENRY JANES, *Auditor*.....Waterbury.

EXECUTIVE COMMITTEE.

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J. H. Linsley, F. R. Stoddard.

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COMMITTEE ON NECROLOGY.

C. C. Smith, Gaysville,

E. M. Pond, Rutland, J. M. Allen, St. Johnsbury.

TRANSACTIONS

.... OF THE ....

EIGHTY-FIRST ANNUAL MEETING

.... OF THE ....

VERMONT STATE MEDICAL SOCIETY,

.... HELD IN ....

MONTPELIER, OCTOBER 11 AND 12, 1894.

The Society met in the County Court House, in Montpelier on Thursday, October 11, and was called to order at ten o'clock a. m., by the President, A. B. Bisbee, of Montpelier.

Prayer was offered by the Rev. Dr. A. M. Lewis, of Montpelier.

PRAYER.

Almighty and everlasting God, the Lord of life and death, of sickness and health, we beseech Thee to be present with this Council of Physicians and Surgeons in annual convention assembled. Save thy servants from all error, ignorance, pride and prejudice; and of Thy great mercy, vouchsafe so to direct,

sanctify, and govern them in their deliberations, that the cause of science, and the Art of Healing may be advanced, and promoted, to the benefit of the sick and suffering, and the alleviation, prevention and cure of the ills to which flesh is heir, through Jesus Christ, our Lord. Amen.

Almighty God, who didst call Luke the Physician, whose praise is in the Gospel, to be an evangelist and physician of the soul; may it please Thee, that, by the wholesome medicines of the doctrines delivered by him, all the diseases of our souls may be healed, through the merits of Thy Son, Jesus Christ, our Lord. Amen.

Direct, O Lord, thy servants, the officers and members of this association, in all their doings, with Thy most gracious favor, and further them with Thy continual help; that in all their work begun, continued, and ended in Thee, they may glorify Thy holy name, and finally by Thy mercy, obtain everlasting life, through Jesus Christ, our Lord, who has taught us, when we pray, to say:

Our Father which art in heaven, Hallowed be thy name. Thy kingdom come. Thy will be done in earth, as it is in heaven. Give us this day our daily bread, and forgive us our debts, as we forgive our debtors. And lead us not into temptation, but deliver us from evil, for thine is the kingdom, and the power, and the glory, for ever. Amen.

The records of the last annual meeting were read by the secretary and approved.

The treasurer, Dr. D. G. Kemp, of Montpelier, presented his annual report, duly audited.

The secretary, Dr. D. C. Hawley, of Burlington, presented his annual report, as follows:

SECRETARY'S REPORT.

Mr. President and Gentlemen of the Vermont State Medical Society:

We have reached another milestone in the history of this society.

I have to report that so far as I am able to judge the society is in a more healthful condition than ever before. Our membership is now 175 as against 181 last year.

There is however a growing interest in the meetings and it is easier to get members to present papers now, than it was a few years ago.

Our membership ought to be increased to 300.

I believe that the next important move for us to make is to establish county or district societies, which shall be in affiliation with and a part of the state society.

I wish again to call your attention to the value of membership in the American Medical Association. I think it would be profitable to every one of us to become permanent members of that organization.

The annual dues, including its journal, are five dollars. Our society, I am happy to state, stands high in the estimation of that association, and of the leading medical men of this country.

The editorial notice given our Transactions, volume 1893, by the Journal American Medical Association is most flattering.

Last year one of the vice-presidents of that association was chosen from Vermont, and this year the address on State Medicine will be given by one of our members.

It is desirable that we cultivate closer acquaintance with the Medical Societies of the New England States, and I wish to urge upon delegates to these societies the importance of attending their meetings and of thus keeping more closely in touch with our medical friends. I am sorry to report that as a rule our delegates do not fulfill the duties of their appointment.

Finally gentlemen, I wish to ask every member of our society to take a personal interest in increasing our membership by inviting the younger physicians in every part of the state to join us. Respectfully,

D. C. HAWLEY, Secretary.

Dr. C. E. Chandler of Montpelier presented the following report as delegate to the New York State Medical Association.

Mr. President and Gentlemen
of the Vermont State Medical Society:

The tenth annual meeting of the New York Medical Association was held at the Mott Memorial Hall, No. 64 Madison Avenue, New York city.

The meeting commenced the ninth day of October and extended over four days. On the first day, my credentials were presented to Dr. Ferguson, the secretary of the associ-

ation, and I was very pleasantly and cordially received and invited to their banquet and excursion.

The association is quite a large one, composed of about eight hundred members. It will be remembered that this society owes its formation to the difference in belief in regard to the code of ethics. The association is supposed to be formed of "old code" members so as to be entitled to membership in the American Medical Association.

Among the visitors were: Mr. Ernest Hart, editor of the British Medical Journal; Dr. D. McLean, president of the American Medical Association, and Dr. N. P. Dandridge of Ohio.

The programme consisted of forty-four papers, and a very few were omitted. The majority of the articles were excellent. The important ones are the following: Fermentation Dyspepsia, by Austin Flint; Bloodless Amputation at Hip Joint, by John A. Wyeth; Surgical Memoranda, by D. McLean; Pleurisy, by Truax; Surgical Treatment of Pulmonary Cavities, by N. P. Dandridge; Appendicitis, by F. Dennis, discussed by D. McLean, Joseph Bryant, and Gouley; Nephrotomy and Nephrectomy, by E. D. Ferguson; Materia Medica, by E. H. Squibb.

The banquet was held at the Hotel Brunswick, on the third evening of the meeting and was very largely attended. One lady physician was present. The menu was very extensive, of the best quality, and served in the most approved manner.

Dr. Thomas D. Strong, the newly elected president of the association proved to be a Vermonter. About thirty-five years ago he was a resident of Montpelier, and principal of the Washington County Grammar school.

The afternoon of the fourth day was taken up by an excursion given by the Commissioner of Charity and Correction to all members of the association. The steamer left the pier at 26th street, and proceeded up the East River, through the islands. In all, we enjoyed a ride of about thirty miles. It was the intention to visit Charity Hospital on the return trip, but owing to the discovery of four cases of smallpox in one of the wards, the visit was indefinitely postponed. However, an inspection of the penitentiary, and a visit of about an hour was made upon the island. The ride was a beautiful one, and the meeting of the association was very instructive as well as entertaining.

C. E. CHANDLER.

Dr. Geo. Davenport, of East Randolph, delegate to the American Medical Association reported as follows:

Having been chosen delegate from the Vermont State Medical Society to the 45th annual meeting of the American Medical association held at San Francisco, Cal., on June 5th to 8th, 1894, I hereby submit my report of said meeting.

There is so much to be written, I had my doubts how much you would "stand" without complaint. Shall it be Science and "Frolic," or "Frolic" and Science or a little of both? "Because the bearing of this observation lays in the application on it" (Bunsby). The American Medical Association was to meet on June 5th at San Francisco, its 45th annual meeting.

On May 24th I boarded a Pullman sleeper at West Randolph, and arrived at Chicago on the 25th. I put up at

the Palmer House. The next day I visited for the third time Jackson Park. On my first visit they had just begun to plow and scrape and dredge and level the knolls in that old swampy pasture—the second in June and July I saw the White City in all its beauty and glory; the third was enough to make any one sad. The delightful Midway was a heap of ruins; the State buildings, almost all of them had vanished and the greater buildings falling in and decaying; railroad tracks everywhere, and I was glad to get away. At five p. m. Monday, May 28th, we started from the Dearborn street station on the Santa Fe track, in a train made up of vestibule pullman sleepers well furnished and equipped with all modern comforts and conveniences. There were I think five of these heavy cars, well filled by members of the association and their friends, the ladies. We bowled along merrily, straight for Pikes Peak, and the dry air of Colorado, and when we came within forty miles of it we dashed into a shower, a cloud break would be a better synonym, and it rained all that day and night, the next day the same, but on Friday the clouds began to break away, but we had no ocular evidence that we were within one thousand miles of that famous mountain. The natives declared the mountain was there in its proper place, just fourteen miles from the Hotel Antlers. We all tried to believe them. I think it rained harder at Denver than at the springs. For a dry climate, this rain of sixty hours duration beats the record, I think. We boarded at the hotels and slept in the cars. The natural outcome of this freshet was the total suspension of travel, either by highway or railroad, and it began to dawn upon our minds what we should do if the blockade was not raised soon.

We had the president of the association, Dr. Hibbard on board. We were more than 1,600 miles from our destination, and ten o'clock a. m. Tuesday, June 5th was fast approaching. It was impossible to take this train over the Midland railway to Salt Lake City, as we expected to do when we started from Chicago. Fortunately we had Mr. Connell, the passenger agent of the Santa Fe road on board, and he said he thought he could get us through to San Francisco on time by way of the route through New Mexico and Arizona, and strike the Southern Pacific road at Barstow.

Any movement was better than standing still, so we started from Colorado Springs about five o'clock p. m. Friday for Pueblo, then over the mountains to Trinidad. We made seven miles per hour on this trip.

In justice to the natives will say that just as we started there was a break in the clouds, enough to show about 200 feet of the top of Pikes Peak, so we knew it was still there.

There were six sleepers in our train now. We thought we had seen enough of sand and sage bush, but it was nothing to the journey through it on Saturday and all day Sunday, until we arrived at the Colorado river, at what is called the Needles, where we dined, so called from the sharp peaks of a ridge of mountains in sight way to the north. Monday morning found us among the mountains of Southern California, making short curves and rumbling through tunnels. I counted seventeen tunnels we passed through before we reached Bakersfield for breakfast.

We arrived safe and sound at the Palace Hotel at five p. m. just in time as Mr. Connell promised us. We made him a present of a fifty dollar watch chain.

Our party all stopped at the Palace as it was the headquarters of the association. When I say our party, I mean we Vermonters. The party comprised Dr. H. D. Holton and wife, Mrs. E. and Miss C. Mr. Jenne and wife, all of Brattleboro, and myself of East Randolph—seven in number.

About 1200 strangers of the medical profession, including 400 ladies invaded the city of San Francisco, and the Doctors of that city, likewise the people "did themselves proud" in ministering to the pleasure and comfort of their guests.

Promptly at ten a. m. Dr. Hibbard called the meeting to order. The wheels then began to move and business was rapidly dispatched. Dr. Holton made his report on the code; this was the bone of contention, but the subject was finally left "in statu quo." A party opposed the revised code by maintaining the old code to be good enough—it had done duty for more than forty years, and would serve for forty more just as well.

Dr. Holton in his report says: "The code of Ethics is violated every day, either wilfully or ignorantly, not only by the rank and file, but by men high in the profession, men who are considered leaders, advanced thinkers and workers. There is not a man within the sound of my voice who cannot call to mind some violation of the letter or spirit of the Code of Ethics that has occurred under his own immediate observation." That was a thrust under the fifth rib. Being on the nominating committee, I attended none of the sections, but I learned one thing, that no man will be elected to an office in the association unless he be present at that meeting.

Another matter was arranged in regard to the postage on the journal. Owing to the worship of red tape at Washington,

D. C., the Journal has been obliged to pay $1,760. more in postage every year than was necessary. You well know how it has been; every member on paying his yearly dues to the treasurer, received the Journal weekly, free. That was what was the matter. Now it is so changed that we subscribe for the Journal, pay five dollars for it, and the American Medical Association relinquish the membership fee and save that $1,760. postage. We hope every member of this society will subscribe for the Journal. It is a good thing to have and to read.

The meeting closed on Friday, after electing Dr. McLean, of Detroit, Michigan, president, together with all the officers.

The medical profession, of San Francisco, gave us a sail on Saturday, across the bay to Uncle Sam's navy yard, on Mare Island, a delightful trip, enough to eat and to drink. I saw nothing stronger than California wine punch. The next morning our party boarded a train destined for Hotel del Monte, an English Hotel of the Forest, where we lunched and spent the afternoon in viewing the grounds which are 126 acres in extent, and is probably the finest flower garden in America, and equals any in Europe. The next morning we took the shore drive of nearly twenty miles. This drive is similar to the one in Newport, R. I. The afternoon of Monday found us back at San Francisco, and Tuesday evening we started for home, leaving behind the Mid-winter Fair, the seal rocks and Chinatown.

Our destination was Portland, Oregon. The main interest over this route is crossing the Shasta range of mountains, with Mount Shasta clothed in everlasting snow, in plain sight for many hours. Consumate engineering skill is here displayed in constructing a railway over and among the snow

clad mountain peaks. We travel seventeen miles to advance three on our course, and after the summit is reached I verily believe the descent on the north side is still more crooked. An observation car enables the traveler to take in the scene at his leisure, at no extra cost. We dined at Ashland, Oregon, about nine p. m. and in the morning we passed Salem, the capital of the state, and reached Portland the chief city at ten a. m. for breakfast. We found that city, a large part of it under water. The water was then six feet higher than ever before known. It had been twelve feet high, but had subsided six. We took in what we could of the city park, and at four o'clock went on board of a very large steamer for a trip on Columbia river, headed for Kelso on the Cowlitz river where we arrived late in the evening. When we entered the Columbia river we found the flood extending for miles on each hand, every house excepting two or three was overturned, barns likewise, apple orchards with only the tops partially in sight, no land in view anywhere. There was no current in this vast body of water for the simple reason that the rains and melting snow furnished more water than the river could discharge into the ocean. On board our sleeper we turned in and when I awoke found myself on the wharf at Tacoma, within a few yards of the City of Kingston, a splendid side wheel steamer, on which we were to take breakfast, and then away through Puget Sound to Victoria, British Columbia. This day was a red letter day. The sun shone bright on the snow clad mountains. There was no wind to ruffle the water of the Sound, as the good steamer bore us swiftly to our destination.

It was a magnificent view. Standing on deck, we saw on the right, the Cascade range of mountains, every peak white

with snow. On the left the Olympic range precisely in the same condition, while Mount Rarrier, 14,444 feet high loomed grandly above them all.

We reached Victoria on time, saw what we could and then started on the same vessel back, and finally landed at Seattle to take the train on the Northern Pacific road for Spokane. The railroad officials assured us the road was in repair, but when we arrived at that city we found that no one knew anything about it. We staid over night, and rather than to be idle had our tickets fixed so that we could be passed along over the Union Pacific road without extra cost, except sleeper ticket. In order to get by a washout on the Northern we traveled over more than 1,100 miles to advance 300 miles. We started about noon and reached the Snake river before dinner and dined at Starbuck, a place a few miles beyond. When I looked at the victuals, it brought to mind the old saying, that "God furnished the food, but the devil furnished the cooks."

Our train passed through Walla Walla in the evening. After we came to Pendleton we struck an easterly direction, crossing and recrossing the Snake till we arrived at Pocatello, from thence due north to Butte, Montana, two days and two nights to get around the washout. We remained here until next day and visited the Alice silver mine, said to be the largest silver mine in the world. There is a vast amount of mining carried on in this city. The next morning we again started east to Bozeman, and here they told us our train which we were to take was nine hours late. Dr. Holton telegraphed to St. Paul, and the officials ordered a special train to be made up for we medical men, and ordered it to carry us to Cinnabar

that afternoon, which it happily for us wanderers accomplished faithfully. The coaches were in waiting to carry us to the Mammoth Hot Springs Hotel where we arrived about ten o'clock p. m. Here we were safe and sound on Uncle Sam's private property for public uses, under proper restrictions, controlled and guarded by two troops of cavalry, whose business it is to patrol the park and bring in all delinquents. Our party took the prescribed tour through the park, occupying six days, board, lodging and transportation, sixty-five dollars each was the price. We traveled over roads built by the government and when in repair would be very good. The distance about 130 miles, and it was a wonderful trip through this wonderland. Go and see it for yourselves. You can do it from here for less than $250. and three weeks time. You will excuse me for not describing the Yellowstone Park in this paper. It would take an hour extra, and it is not to be done.

After we had completed the tour we packed our valises and vacated our rooms, and had a good breakfast, and while patiently waiting for the coach the news came by wire, the Northern Pacific was tied up by the great strike. No transportation by rail, and we were left "distressed and stranded," and home seemed a great way off just then. The landlord kindly cut the price of board down to three dollars per day. We found after being idle six days we could take a train on the Great Northern and escape out of the Rockies by way of that, through North Dakota, home, if we could reach Helena, Montana. There was no way by which we could do that, except by coach. Eighteen of us at one o'clock p. m. on the third of July, started for Livingston in two coaches with four horses each. The distance was sixty miles. We arrived there next day at noon

where we staid till eight o'clock, July 5th, then westward was the cry, 125 miles to Helena. The road we had already passed over was simply frightful. Take the worst road you ever saw, then multiply it by ten and you would fall short in the true estimate of it. I doubt if there is a farmer in the State of Vermont who has not a better road to his back lot than this stage road. I don't believe there had been one dollar a mile paid out for repairs in two years. It would drive a Vermonter crazy were he obliged to use such roads. We were back again at Bozeman at noon, after crossing one of the spurs of the Rockies. We put up at the Bozeman House where the accommodations and attendants were pretty near zero. At seven the next morning we were under way for Radersburg, through the Gallatin valley, a magnificent farming country where it can be irrigated. We arrived at Radersburg about eight p. m. having no change of horses for sixty-five miles. We were now within forty miles of the depot. At this place some seven companies were working the Placer gold mines. We started about nine p. m. for Helena. Eight miles carried us to the top of the first mountain. Luckily it was a bright star-light night. We struck the Missouri river at two a. m. watered the horses and then on to climb the next ridge where we found the worst road, but not the most dangerous. I can tell you exactly how it was.

Imagine a stone wall built of cobble stones, none of them larger than a bushel basket, evenly distributed over a space twelve feet wide, the length of the wall, then with a loaded coach drawn by four horses drive over it and you will have precisely the idea of that road. Well this lasted about five miles to the top of the hill. After that the road was fairly

good until we reached Helena, where we arrived at eight a. m. in season for breakfast, without change of horses. I thought the sun was late that morning.

At the proper time we boarded the Pullman car for St. Paul on the Great Northern road which took us through Prickley Pear Canon, a grandly wild place on to the great falls of the Missouri. Captain Clark was the first white man to see these falls in 1805. We passed Fort Buford and Fort Benton, then our course was easterly through the valley of the Red River of the North, the great wheat region of the United States.

At Grand Forks, North Dakota, our pleasant party was separated, divided, the Brattleboro contingent remained at Grand Forks while I continued on, and the next morning found myself at the Union Depot at Minneapolis, and as I then thought, almost home.

I traveled in thirteen states, besides British Columbia, all new to me, and I kept my eyes open to see all I could see in passing along, but I came to the conclusion after mature deliberation, that for the remainder of my days, Vermont was a good enough place for me.

GEORGE DAVENPORT, Delegate.

Dr. J. H. Linsley reported verbally as delegate to Dartmouth Medical College.

Report of delegate to Medical Department of the University of Vermont was made by Dr. H. L. Newell, as follows:

Mr. President and Gentlemen
of the Vermont State Medical Society:

As one of your delegates to the Medical Department of the University of Vermont, I would report that I was able to be present one day only at the examination of candidates for the degree of M. D., which time I diligently spent in looking over the examination papers. A recent, although not entirely new feature is the written examination. These examinations, while severely testing the knowledge of the student, are fairer than oral examinations.

I was impressed by the *practical* character of the questions and with the uniform excellence of the answers.

I am glad to state that there is evidence of advancement along the line of higher educational requirements before a student can receive a diploma from this school. This is as it should be. The people are awake and demand and expect the best, and the best is none too good. This will soon mean a four years' course, a state examining board with something more than a mere farcical entrance examination.

The grand old Alma Mater is worthy the loving esteem, confidence and support of all her noble sons who believe in progress, and we should rejoice that she is abreast with the advance guard of the great galaxy of Esculapion institutions.

I wish here to acknowledge the courtesy shown me by the medical faculty, as well as to express my appreciation of the honor of being your delegate.

Respectfully,

H. L. NEWELL, Proctor, Vt.

The following proposed amendments to the Constitution and By-Laws, introduced at the last annual meeting were unanimously adopted:

Resolved, That Art. 2 of the Constitution be amended by inserting after the words "Publication Committee of three members," the words "of which the Secretary shall be Chairman," and by striking out the words "Board of Councillors, consisting of one from each County" and inserting in their place, the words "A Committee on Necrology of three members, a Committee on Membership of three members," etc.

In the same Article shall be inserted after the words "As the Society shall direct." "Except the Committee on Membership, which shall be elected at the Morning Session of the first day."

That Sec. 9 of the By-Laws be revised to read as follows:

The duties of the Committee on Membership shall be to examine the credentials and qualifications, with reference to their method of practice, etc., of persons desirous of becoming members of the Society, and present at each meeting the names of such as, in their opinion, are eligible to Membership under the Constitution and Regulations of the Society. They shall recommend for membership, only such physicians as shall present to them their diplomas, or a certificate in writing signed by some member of the Society in good standing, stating that he has personal knowledge that said applicant has a diploma from a regular recognized medical school.

The Committee on Necrology shall report the names of deceased members, and shall cause to be prepared such brief biographies as may in each case be deemed best.

On motion of Dr. D. C. Hawley, the Chair appointed a Committee on Membership of three members, as follows: Drs. O. W. Sherwin, of Woodstock; H. R. Wilder, of Swanton, and J. H. Linsley, of Burlington.

The Chair appointed the following Committee on Nominations: Drs. J. H. Jackson, O. W. Sherwin, L. M. Green, Lyman Rogers, and J. H. Linsley.

On motion it was voted that it is the sense of the Society that hereafter the president preside throughout the entire two days session.

Dr. Geo. Davenport read a paper on "Puerperal Eclampsia," which was discussed by H. R. Wilder, O. W. Sherwin, J. H. Linsley, J. H. Jackson, and E. F. Upham.

Adjourned at twelve o'clock.

AFTERNOON SESSION.

Met at two o'clock.

Dr. E. M. Pond, Vice-president of the society presented the "Address in Surgery." This was discussed by Drs. J. B. Wheeler, J. C. Irish, and J. H. Jackson.

Dr. J. D. Brewster's paper, entitled, "The Recent Typhoid Fever Epidemic, at Windsor, Vt.," was read by the secretary.

Dr. Frederick C. Shattuck, of Boston, presented a paper on "The Modern Treatment of Typhoid Fever."

Discussion of the two latter papers was participated in by Drs. A. P. Grinnell, M. R. Crain, C. W. Peck, O. W. Sherwin, and H. R. Wilder.

A paper on "The Management of Pregnancy," was read by Dr. D. L. Burnett, of South Royalton, and discussed by Dr. H. R. Wilder.

This was followed by a paper entitled "The care of patients during Gestation and Confinement," by H. L. Newell, of Proctor, which was discussed by C. W. Peck, E. M. Pond, and M. H. Eddy.

Adjourned at 5:15 o'clock.

EVENING SESSION.

Met at eight o'clock, with the Vice-president Dr. E. M. Pond, in the chair.

Dr. J. B. O'Neil, of Portland, delegate from the Maine Medical Association, presented credentials, and was invited to participate in our deliberations.

Dr. A. B. Bisbee, of Montpelier, presented the President's annual address, entitled "Some of the conditions which favor Tuberculous Infection."

Discussion of the address was participated in by Drs. J. H. Jackson, A. P. Grinnell, C. S. Caverly, and F. C. Shattuck.

Adjourned at 9:20 o'clock.

THE BANQUET.

At ten o'clock the members of the society, delegates, and invited guests convened in the dining room of the Pavilion

House for the Annual Banquet, Dr. A. P. Grinnell being Anniversary Chairman.

After a sumptuous repast, the tables were rapped to order and short speeches were interspersed with stories until the "wee sma" hours. The feature of the occasion was the reading of an unpublished poem of the late Dr. Oliver Wendell Holmes, by Dr. F. C. Shattuck, of Boston.

FRIDAY—SECOND DAY.

Meeting called to order at nine o'clock.

The following officers were elected for the ensuing year:

OFFICERS.

J. H. LINSLEY, *President*.....Burlington.
F. F. CHAFFE, *Vice-president*.....Hartford.
D. C. HAWLEY, *Secretary*.....Burlington.
D. G. KEMP, *Treasurer*.....Montpelier.
HENRY JANES, *Auditor*.....Waterbury.

EXECUTIVE COMMITTEE.

D. C. Hawley,

J. H. Linsley, F. R. Stoddard.

PUBLICATION COMMITTEE.

J. B. Wheeler,

D. C. Hawley, H. C. Tinkham.

LICENSE CENSORS.

E. S. Albee, Bellows Falls,

C. M. Ferrin, Essex Junction, H. S. Browne, St. Johnsbury.

COMMITTEE ON NECROLOGY.

C. C. Smith, Gaysville.

E. M. Pond, Rutland. J. M. Allen, St. Johnsbury.

ANNIVERSARY CHAIRMAN,

A. B. Bisbee, Montpelier.

DELEGATES.

Univ. of Vt., Med. Dept. C. W. Peck, C. L. Erwin.
Dart. Med. Col. J. B. Wheeler, J. W. Jackson.
N. H. Med. Soc. H. H. Lee, O. W. Peck.
Me. Med. Asso. Deane Richmond, F. C. Morgan.
Mass. Med. Soc. C. F. Camp, J. H. Jackson.
R. I. Med. Soc. S. W. Paige, C. O. Boyden.
Conn. Med. Soc. J. M. Clarke, Lyman Rogers.
N. Y. Med. Asso. D. C. Hawley, M. R. Crain.
N. Y. Med. Soc. H. L. Newell, D. G. Kemp.
Northern N. Y. Med. Asso. H. R. Wilder, F. R. Stoddard.
White Mt. Med. Asso. C. C. Smith, C. M. Ferrin, E. H. Ross.
Conn. River Valley Med. Asso. A. L. Bingham, G. B. Nichols.
American Med. Asso. S. L. Wiswell, C. E. Chandler, O. W. Sherwin, D. C. Hawley, A. B. Bisbee, E. M. Pond, C. F. Camp, D. F. Rugg, H. D. Holton, E. S. Albee, J. N. Jenne, W. D. Huntington, C. S. Caverly, R. M. Chase, Henry Janes, D. L. Burnett, L. M. Bingham, H. O. Worthen, and J. S. Richmond.

Dr. M. R. Crain presented the following report of The Board of License Censors:

The board of Censors have when the applicant has not come in person, required him to send his diploma, or a letter from some *member* of this society stating that *he* has examined the applicant's diploma.

There have been thirty-seven applications, and licenses have been issued to thirty-six.

The man that we did not give one to, was one Dr. Beardsley, an itinerant doctor.

DR. L. W. HUBBARD

Has issued license to the following (nine) physicians:

Dec. 30, '93. Edward Fifield Root, East Burke, Vt.
Dartmouth, class '92.

June 6. Patrick Joseph Kinsley, Eden Mills, Vt.
Queens University, Kingston, Ontario, class '94.

June 6. Henry Augustine Elliot, Barnet, Vt.
U. V. M. class '94.

June 6. Joseph Samuel Doziel, Barre, Vt.
Laval University of Montreal, class '93.

July 5. Chas. A. Cramton, Burlington, Vt.
U. V. M. class '93.

July 5. H. Nelson Jackson, Burlington, Vt.
U. V. M. class '93.

July 7. Chester Lyman Hodgkins,
College Physicians and Surgeons, Boston, Mass., class '94.

Sept. 29. Frederick C. Page, Johnson, Vt.
University of Pennsylvania, class '94.

Sept. 29. William A. Young, Westfield, Vt.
Class '94.

DR. E. S. ALBEE

Has issued licenses to the following (six) physicians:

GILMAN D. FROST, Hanover, N. H.

A. L. MINER, Weston, Vt.
Graduate of Baltimore Medical College, class '94.

C. W. WORTHEN,
Graduate U. V. M. class '93.

L. C. GAY, Brownsville, Vt.
Graduate University of N. Y. City, class '93.

F. C. ANGELL, West Randolph, Vt.
Graduate Baltimore Medical College, class '94.

S. D. SONS, Gaysville, Vt.
Graduate Jefferson Medical College, class '91.

DR. M. R. CRAIN

Has issued licenses to the following (twenty-one) physicians:

A. J. LANCE, Worcester, Vt.
Graduate U. V. M. class '93.

T. F. GARTLAND, St. Albans, Vt.
Graduate U. V. M. class '93.

WM. F. CUMMINGS, Rutland, Vt.
Graduate U. V. M. class '93.

WM. L. QUIVEY, Rutland, Vt.
Graduate Rush Medical College, class '94.

J. W. SENDDER, West Halifax, Vt.
Graduate Dartmouth, class '86.

H. E. BALLARD, Burlington, Vt.
Graduate U. V. M. class '93.

W. W. TOWNSEND, Burlington, Vt.
Graduate U. V. M. class '93.

[Licenses—continued]

E. E. Dean, Tunbridge, Vt.
Graduate U. V. M. class '88.

J. W. Racette, Bennington, Vt.
Graduate of Albany Medical College, class '93.

George E. Paul, Rutland, Vt.
Graduate of Albany Medical College, class '69.

August T. Radike, Burlington, Vt.
Graduate Ensworth Medical College, Mo., class '94.

James W. Dawson, Brattleboro, Vt.
Graduate Toledo Medical College, class '94.

L. F. Alfredus Oullet, Shoreham, Vt.
Graduate Lavalle University, Montreal, class '94.

Wm. T. Kensett, Burlington, Vt.
Graduate U. V. M. class '94.

Nathaniel Wallis, Burlington, Vt.
Graduate U. V. M. class '94.

Geo. B. McGraw, Poultney, Vt.
Graduate Albany Medical College, class '94.

Chas. E. Griffin, Fair Haven, Vt.
Graduate University of Pennsylvania, class '94.

L. C. Holcombe, Milton, Vt.
Graduate U. V. M. class '94.

James M. Hackett, Champlain, N. Y.
Graduate U. V. M. class '88.

Wm. B. Hyde, St. Albans, Vt.
Graduate Kentucky School of Medicine, class '94.

F. E. Clark, Burlington, Vt.
Graduate U. V. M. class '94.

I received a letter from Dr. A. L. Cross of Newbury, asking that the license of Dr. Geo. B. Hatch, of Newbury be

revoked, because it was obtained through fraud and that said Hatch was illiterate and guilty of unprofessional conduct.

The license was issued by Dr. Jenne, of St. Albans, about 1889.

We did not take any action because the subject had been brought up at a meeting of this society and it was decided *not* to revoke his license.

Respectfully submitted,

M. R. CRAIN,

Chairman of Board of Censors.

A paper on "Tuberculosis in the Lower Animals, and its relation to Public Health," was presented by Dr. F. A. Rich, of Burlington, and was discussed by Drs. J. H. Linsley, H. D. Holton, and C. W. Peck.

As an outcome of the paper and discussion, the following which was introduced by Dr. J. H. Jackson, was unanimously adopted:

Resolved. "That this society recommend the State Board of Health, to present such suggestions to the Vermont Legislature as may lead to such legislation as shall protect the public from tuberculous infection through the lower animals."

Dr. J. C. Irish, of Lowell, Mass. read a paper on "The Surgical Treatment of Uterine Neoplasms." The paper was discussed by Drs. D. C. Hawley, E. M. Pond, J. B. Wheeler, and O. B. Douglas, of New York.

Burlington was selected as the place of meeting in 1895.

On motion, adjourned.

AFTERNOON SESSION.

Met at two o'clock.

Dr. C. S. Caverly read a paper on the "History of an Epidemic of Acute Anterior Poliomyelitis," discussed by Drs. H. L. Newell, and J. N. Jenne.

Dr. F. D. Robertson's paper on "The Indiscriminate use of Modern Antipyretics" was read by title only.

Dr. Geo. B. Nichols, of Barre, read a paper on "A retrospect in the study of Uric Acid," which was discussed by Dr. J. H. Linsley.

The following named physicians were elected to membership.

G. F. Edmunds, Hinesburgh .....
H. A. Bogue, Bristol.....U. V. M. '86
Geo. W. Belden, Jericho..... do '91
E. H. Ross, St. Johnsbury.....
Chas. P. Newton, Underhill.....
H. R. Watkins, Burlington.....U. V. M. '93
Frederick C. Page, Johnson.....Univ. Pa. '94
W. S. May, Underhill.....U. V. M. '73
W. L. Heath, Richmond..... do '90
M. L. Chandler, Barre..... do '91
Geo. H. Gorham, Bellows Falls.....Univ. N. Y. '82
A. L. Miner, Weston.....Baltimore '94
L. C. Gay, Brownsville,.....Univ. N. Y. '93
Fred J. Morse, Royalton.....Baltimore '94
Geo. H. Newton, Irasburgh.....U. V. M. '91
A. J. Lance, Worcester..... do '93
I. N. Fowler, Groton..... do '93

W. B. Hyde, St. Albans ..... U. V. M. '94
C. E. Allen, Swanton ..... McGill '83
Wm. Lindsay, Georgia ..... do '93
T. F. Gartland, White River Junction ..... U. V. M. '93
F. C. Kinney, Greensboro ..... Reinstated
S. J. Allen, White River Junction ..... do

Dr. Frederic C. Shattuck of Boston, and Dr. John C. Irish of Lowell, Massachusetts, were elected honorary members.

The following members were appointed to prepare papers for the next meeting:

F. F. Chaffee, Address in Medicine; J. B. Wheeler, Address in Surgery; C. S. Caverly, Address in State Medicine; S. E. Lawton, L. M. Green, O. G. Stickney, L. W. Hubbard, J. N. Jenne, E. M. Brown, C. E. Chandler, J. M. Allen, Geo. B. Hurlburt, D. C. Hawley, W. D. Huntington, H. H. Lee, O. W. Peck, D. F. Rugg, and S. W. Paige.

ATTENDANCE.

A. B. Bisbee, Montpelier.
C. E. Chandler, Montpelier.
D. G. Kemp, Montpelier.
C. M. Hunt, Montpelier.
O. W. Sherwin, Woodstock.
C. F. Hawley, Fairfax.
H. R. Wilder, Swanton.

[Attendance—continued.]

C. E. Allen, Swanton.
C. F. Camp, Barre.
O. G. Stickney, Barre.
J. H. Jackson, Barre.
Geo. B. Nichols, Barre.
J. W. Jackson, Barre.
J. E. McSweeney, Barre.
H. O. Worthen, Barre.
J. H. Linsley, Burlington.
D. C. Hawley, Burlington.
J. B. Wheeler, Burlington.
H. A. Crandall, Burlington.
A. P. Grinnell, Burlington.
J. M. Clarke, Burlington.
F. A. Rich, Burlington.
Geo. Davenport, East Randolph.
Geo. B. Hurlburt, Jericho.
E. S. Albee, Bellows Falls.
W. L. Heath, Richmond.
E. B. Watson, Williamstown.
M. D. Warren, Cabot.
O. H. Perkins, Worcester.
D. L. Burnett, South Royalton.
E. F. Upham, West Randolph.
D. F. Rugg, Hartland.
E. S. Weston, Newfane.
R. T. Johnson, West Concord.
O. D. Green, Warren.
J. H. Winch, Northfield.

[Attendance—continued]

J. D. Brewster, Windsor.
Henry Janes, Waterbury.
H. L. Manchester, Pawlet.
F. C. Morgan, Felchville.
W. D. Huntington, Rochester.
J. D. Tanner, Winooski.
O. W. Peck, Winooski.
L. M. Green, Bethel.
M. R. Crain, Rutland.
C. S. Caverly, Rutland.
E. M. Pond, Rutland.
C. M. Ferrin, Essex Junction.
M. H. Eddy, Middlebury.
E. H. Martin, Middlebury.
H. L. Newell, Proctor.
Wm. R. Hutchinson, Enosburgh.
C. W. Strobell, Rutland.
C. W. Peck, Brandon.
A. L. Bingham, Williston.
W. H. H. Varney, Charlotte.
F. C. Brigham, Pittsfield.
Geo. H. Gorham, Bellows Falls.
W. F. Gilman, Brownington.
F. R. Stoddard, Shelburne.
C. W. Jacobs, Richmond.
S. E. Darling, Hardwick.
J. A. Howard, Alburgh Springs.
L. W. Hubbard, Lyndon.
H. W. Barrows, Stowe.

[Attendance—concluded.]

E. H. Bushnell, Jeffersonville.
Geo. H. Newton, Irasburgh.
S. W. Paige, St. Albans.
J. N. Jenne, St. Albans.
H. D. Holton, Brattleboro.
Wm. Platt, Shoreham.
T. F. Gartland, White River Junction.
H. H. Lee, Wells River.
J. M. Allen, St. Johnsbury.
Edw. H. Ross, St. Johnsbury.
R. M. Chase, Bethel.
E. M. Brown, Sheldon.
W. G. Church, Stowe.
C. C. Smith, Gaysville.
Wm. Lindsay, Georgia.
F. C. Kinney, Greensboro.
I. N. Fowler, Groton.
Jas. B. O'Neil, Portland, Maine, Delegate.
E. O. Crossman, Lisbon, N. H.
Frederic C. Shattuck, Boston, Mass.
John C. Irish, Lowell, Mass.
O. B. Douglas, New York.

Total attendance 87.

On motion, adjourned.

D. C. Hawley, M. D. Secretary.

PRESIDENT'S ADDRESS.

BY A. B. BISBEE, M. D., MONTPELIER.

Gentlemen of the Vermont Medical Society:

1813-1894! Four score years and one!

During this long period of time the Vermont State Medical Society has maintained a healthy and useful existence. "A life so enduring is a title of character, a certificate of good conduct, a voucher of respectability."

As it enters upon its eighty-second year, no signs of approaching senility are perceptible. Its vitality is not waning. Never in its history was its condition more prosperous, its membership larger, its meetings better attended, or the character of the work accomplished of a higher order.

On an occasion like this it were, perhaps, fitting to indulge in mutual congratulations—to cast a retrospective glance over the history of this organization, to recount its honorable achievements and to pay tribute to those worthy men who in the years gone by have labored most strenuously to promote its interests. Especially is it proper, also, that we consider carefully when met together in our annual council what fresh impetus is needed to place our society on a still higher plane of efficiency, that it may more fully answer the purpose of its being and that every reputable physician in the State may find it desirable to affil-

iate with us. "By retrospection and introspection an individual as well as a profession may be benefitted."

Our "Transactions," however, furnish such conclusive evidence that this ground has already been completely and ably covered that I feel compelled to search for another theme.

An examination of these published records also reminds me that my predecessors in this office with which you have honored me have thoroughly garnered the conventional field of Presidents' addresses. Our noble profession and its long list of heroes have been often eulogized. You have been told of the need of better laws for the regulation of the practice of medicine and for the protection of the public from imposture, of the necessity of a higher and broader culture in those who enter our ranks. The question of medical ethics has received distinguished consideration. The most important advances made during recent years in the different departments of medical science, the triumphs of modern surgery and of State medicine, the substantial additions to the materia medica, the most startling revolutions in pathology have been from time to time reviewed. You will pardon me, therefore, if I digress from the path usually pursued and present for your consideration this evening not a general topic but a few facts in regard to one special disease—a disease so fatal in totality of effect that its discussion from any point of view, which may add to our knowledge of the subject, is of paramount importance whenever the question of public health, human longevity and human happiness may be raised.

In a paper read before this society three years ago, I brought forward some statistics culled from the records of life

insurance companies bearing upon the question of "Predisposition to Consumption," or "Some of the Conditions which Appear to Favor Tubercular Infection." My report made at that time was hurriedly prepared and was based on an incomplete examination of the material at my disposal. Further research along the same line has enabled me to study a very much larger number of cases and to collect such an array of additional data that I venture to again call your attention to the same subject.

The theory that all forms of tubercular disease—and I use the term "Consumption," synonomously with pulmonary tuberculosis—are due to a microscopic organism, the tubercle bacillus, appears to have gained almost universal credence. Few observers, competent to speak with authority, deny to-day that the entrance into the body and growth there of this parasite is the true exciting cause of phthisis.

Consumption is an infectious disease and the tubercle bacillus is the infecting principle.

It by no means follows from this, however, that the bacillus is the sole factor in the production of this great scourge of the human race.

On the contrary it is practically certain that unless there is an antecedent cause in operation, a something in the constitution of the individual which favors infection, a morbid susceptibility, a predisposition. the specific germ is innocuous. The bacillus alone cannot give rise to the disease.

Proof of this assertion is found in the fact, that although these micro-organisms are very widely diffused in all civilized communities, the majority of individuals successfully resist their invasion. When we consider the great prevalence of con-

sumption, and that a single patient may throw off from his body with the sputum in one day millions of bacilli which are so wonderfully tenacious of life that they retain their activity in a dried state for months, it becomes evident that we all live in a tubercular atmosphere. Were there not some safeguard, some barrier between us and infection, were there not some special conditions which must be complied with before the exciting cause can do its specific work, we should all become tuberculous—the race would have been exterminated long ago.

Evidence that other contributory causes are essential to the growth and development of the bacillus is found also in the varying degrees of resistance offered by different species of animals and by different individuals of the human species to bacillary infection. Pathologists tell us that certain animals, particularly rabbits and guinea pigs, are very easily inoculated with the tubercular virus, while certain other animals, notably dogs and horses and goats, are usually not inoculable. It has been found, also, that even in case of the most susceptible species, if after inoculation the environment is favorable, if the animals are given an abundance of fresh air, sunlight and suitable food, the direful effects of the disease are many times averted.

The material injected being the same in all cases, it follows that there must be something in the animals themselves which determines the totally different results. If the bacillus *per se* is a sufficient cause, why do not all animals alike fall victim?

Clinical experience teaches us that the same difference in degree of vulnerability is manifested by the human species.

"A large proportion of individuals enjoy an immunity which appears to be complete. Many others, while capable of infection, show a remarkable resistance to the tubercular process which either undergoes a resolution in the region infected or makes a tardy progress interrupted by more or less prolonged periods of quiescence. Between cases of this form and cases called *phthisis florida* the disease manifests every degree of intensity." (Wilson.)

The necessity of an underlying cause, a predisposition is seen not only in consumption, but also in the whole class of infectious diseases. Some one has said that "It is about as hard for an old man to get typhoid fever as to learn a new language." Other factors in addition to the specific germ are requisite for the production of diphtheria. The infecting germ of pneumonia, we are told, is habitually present in the saliva of many perfectly healthy people. "Here we have a bacterium which may be carried in the mouth for years without producing any known injurious effects, and yet which under certain circumstances may give rise to the local pulmonary disease known as croupous pneumonia."

"When Asiatic Cholera prevails in a city on account of a contamination of its water supply, not all who drink this water suffer an attack of the disease, but the victims are found among those who are especially susceptible to gastric and intestinal disorders or who have committed some recent imprudence in eating and drinking, or whose vital resisting power is reduced by fatigue, mal-nutrition, vicious habits, etc.

In epidemic influenza the development of an attack in those exposed to infection no doubt often depends upon 'taking cold' in the ordinary sense of the word." (Sternberg.)

All disease-producing germs require certain favorable conditions for their growth and activity. The prime factors in the etiology of consumption and of other infectious diseases are, therefore, (1) the infecting germ, and (2) the favoring conditions. If either of these factors is wanting, there can be no tuberculosis.

The torch applied to a fire proof building can do no damage, and on the other hand the worst fire trap never burns down unless there is a spark to kindle the flame.

A somewhat hackneyed but very apt comparison is that of the seed and soil. The man who desires to grow a profitable crop of corn must not only give attention to the quality of the seed and its proper planting, but he must also choose a soil naturally adapted to the raising of corn. The selection of an improper soil will as certainly defeat his object, as will the failure to plant the seed.

You will remember that in the old story of the sower who went forth to sow, only that small fraction of the seed which fell upon good ground sprang up and bore fruit. The larger part met with conditions unsuited to its germination and growth. So in tuberculosis unless the soil is congenial, the seed cannot thrive.

In these days when so much attention is being given to the infecting agent; when Boards of Health are considering the advisability of isolating consumptive patients and are devising all sorts of schemes for the destruction of their sputa, the profession seems in great danger of losing sight entirely of the other great fundamental factor in causation. It is important, of course, to obtain all possible information in regard to the

bacillus, but in order to solve the whole problem we must extend our investigation beyond the domain of the laboratory and the microscope to the human system and learn what the conditions are which render it especially liable to be affected injuriously by the ubiquitous germ of tuberculosis.

In presenting some statistics to-night bearing upon this point, I am very well aware of their limited value. They are based upon a study of insured lives and, consequently, they apply not to the general population but only to selected lives of insurable ages and belonging to what may be termed the insuring classes. I trust, however, that they may not prove altogether worthless certainly to those of us who are called upon to give advice concerning the selection of lives for insurance purposes.

I. *Age.* That consumption shows a tendency to develop at certain ages, in other words, that age is a predisposing factor, is a very generally accepted theory. The consensus of opinion among medical men appears to be that from twenty to thirty years of age is the favorite period for the occurrence of the disease. It was long ago shown, however, that there is no substantial foundation for this conclusion. While it is true that there are more deaths from consumption at these than at later ages, it is also true that there are more people living at these ages. The ratio of consumptive deaths to the number of people living is about the same at all periods of life.

Table A, compiled by Dr. Edgar Holden, of Newark, shows the ratio of consumptive deaths to 10,000 living, both in the community at large, and among selected lives.

Table A.

Ratio of Consumptive Deaths to each 10,000 Living.

Age,	21-30	31-40	41-50	51-60	61-70	71-
New York City,	70	71	66	84	110	150
12 German Companies,	29	39	34	33	32	—
Mutual Benefit N. J.,	22	20	14	14	27	37
All England,	40	41	39	37	27	11
Mutual Life N. Y.,	24	20	17	14	18	30
U. S. Census, 1870,	23	27	27	31	40	79

It will be seen that the mortality instead of being greater during early adult life, as is usually supposed, rather increases with advancing years.

Dr. Holden well says that "The figures dealt with have been so large as to make deductions from them secure and the correspondence of results from the diverse sources enumerated in the table can leave no doubt of the correctness of the conclusion."

II. *Family Record.* In attempting to ascertain the influence of a consumptive family record as a factor in predisposition, I have compiled the mortality statistics of the National

Life Insurance Company of Vermont, with special reference to this point, and I have put the results in the same form as those of the Washington Life of New York, published a few years ago in order that the experience of the two companies might be combined and a better average thus obtained.

From these sources we get a record of 3787 male lives, 3787 deaths from all causes, 665 or 17.3 per cent of which as shown in Table B, were from consumption.

Table B.

	Total.	Deaths from Consumption.	Percentage.
Total,	3787	655	17.30
Hereditary Consumptive Taint,	668	158	23.65
No Hereditary Consumptive Taint,	3119	497	15.93

Of the whole number of cases 668 manifested a consumptive family taint at the time they were insured. These figures represent consumptive deaths in the immediate family or among parents and brothers and sisters. About 24 per cent of these 668 hereditarily predisposed persons afterward died from consumption, while of the 3119 cases with no such family tendency, about 16 per cent died from this cause. The presence of a family taint apparently increased the mortality from consumption about 50 per cent.

But there are two principal reasons for believing that the table does not represent the full influence of inheritance in these cases. In the first place, it must be remembered that the facts are given here as they existed at the date of entry. Could the records be completed up to the time of death, which in the experience of the National averaged 11.2 years later, it is not unfair to suppose that a family history of consumption would appear in some of the 497 cases classed in the table as deaths from consumption with no such history.

In the second place it is a fact well known to all insurance men that the term "Consumption" is an ugly one. A certain percentage of applicants are so averse to mentioning it as the cause of death of near relatives that they substitute such other terms as "congestion of the lungs," "pneumonia," "debility," "fever," "grief," "exposure," "over-work," "child-birth," etc. In the construction of this table, however, none of these indefinite terms were accepted as indicating an hereditary taint, and it is, therefore, no doubt true that more than 668 out of the whole number actually did belong to consumptive families at the time they were insured.

But, although it is not possible to ascertain the full influence of a consumptive family history as a determining factor in these cases, the table plainly shows that those men whose fathers or mothers or brothers or sisters died from consumption were more susceptible than were those who came from more healthy stock.

Table C.

	Total.	Deaths from Consumption.	Percentage.
Both parents,	5	3	60.00
One parent and one or more brothers or sisters,	62	19	30.65
Mother alone,	157	46	29.30
Father alone,	79	22	27.85
One brother or sister,	292	53	18.15
Two or more brothers or sisters,	73	15	20.55

In Table C the cases are arranged according to the degree of the hereditary tendency.

It will be observed that the percentage of deaths from consumption varies according as the taint appears in parents or in brothers and sisters. Of those persons who stated in their applications that the mother alone had died from consumption about 29 per cent afterward developed the disease, as did also about 28 per cent of those whose fathers alone were consumptive, while the percentage drops to 18 in those cases whose family records showed a consumptive taint in one brother or one sister, and only rises to 20.55 in the group where two or more brothers or sisters had died from consumption. Evidently consumption in either parent is of greater significance than when it appears in brothers and sisters.

Table D.

	Total.	Deaths from Consumption	Percentage.
One member of family,	528	121	22.92
Two or more members of family,	140	37	26.43

Table D gives a classification according to the number of consumptive deaths in the family.

It seems only natural to suppose that the intensity of an hereditary tendency must be greater in those cases where the disease has shown itself in two or more members of the family than when only a single member has succumbed to it. Such a theory has been very widely accepted and great stress has been laid upon this point in selecting insurance risks. The practice of some companies is or has been, I am told, to decline all applicants who present a history of two cases of consumption in the family. When there is only one case, it is often disregarded on the ground that it was probably accidental or acquired, but the occurrence of two cases in the same family is held to be good evidence of a family tendency. Table D does not lend very strong support to this idea. Of the first group, which includes 528 cases with one consumptive death in the family, about twenty-three per cent died from this cause, while less

than four per cent more died from consumption when there was a history of two or more cases in the family.

The figures already presented indicate that in the cases studied, a family history of consumption was a determining factor of considerable potency. I now wish to adduce some evidence upon the question of whether an inherited consumptive taint is to be construed as signifying also a smaller average sum of vitality, and, therefore, a greater susceptibility to other forms of disease with consequent less ability to resist their effects.

It is very generally believed that members of consumptive families are not only more liable to develop phthisis than are individuals more highly favored in this regard, but that they offer less than the average amount of resistance to any disease; that they die in large numbers and at comparatively early ages from acute diseases, as typhoid fever and especially from acute affections of the air passages; that they are as a class inferior lives.

The records of insurance companies furnish the necessary data to enable actuaries to measure the precise influence of a consumptive taint upon the ratio of deaths from all causes. This is done by comparing the actual deaths among this class of lives with the expected deaths calculated upon the number living at the beginning of each year.

Table E.

Number of deaths among lives with family history of Consumption compared with expected deaths.

Relations who died from Consumption.	Entered.	Died.	Expected Deaths.
LINEALS ONLY.			
One parent only,	152	42	33.661
Father only,	69	20	16.091
Mother only,	83	22	17.570
Both parents only,	9	3	3.821
	161	45	37.482
LINEALS AND COLLATERALS.			
One parent and one brother or sister,	58	11	12.399
Both parents and one brother or sister	2	0	.242
	60	11	12.641
COLLATERALS ONLY.			
One brother or sister,	282	73	71.510
Two or more brothers or sisters,	81	22	22.699
	363	95	94.209
Totals,	584	151	144.332

Table E gives us the result of such an investigation of the mortality experience of the Mutual Life of London.

Of 584 individuals insured with a family history of consumption, 151 had died while the expected deaths, according to the table, were only about 144. A consideration of these facts can only lead us to the conclusion that by reason of the inherited tendency these 584 lives were below the average as regards vitality.

The contrast between actual and expected deaths is particularly striking in the first group where the taint appeared in one or both parents. 161 cases entered, the number of deaths was 45, the expected deaths only 37. On the other hand the death of collateral relations from phthisis, as shown in the last group, did not appear to increase the risk materially, the actual deaths being 95 and the expected 94. Of the second group Mr. Manley says: "The cases where there has been evidence of consumption in a parent and another member of the family are too few to make the observations of any value."

The experience of the National Life of London, given in Table F, corroborates the facts already presented.

Table F.

Ages.	Actual Deaths.	Expected Deaths
15-35	169	119.7
35-65	151	132.7
Total	320	252.4

The actual deaths among hereditarily predisposed policyholders were 320 and the expected only 252.

III. *Acquired Predisposition.* Of the 3787 cases representing the total number of deaths in the combined experience of the Washington Life and the National Life of Vermont, 391 gave such a history of past sickness or the physical condition at the time of examination was such as to indicate an acquired consumptive tendency.

Table G gives us a classification of these 391 cases.

Table G.

Acquired tendencies to Consumption.	Total Number of Cases.	Deaths from Consumption.	Percentage.	Acquired taint alone.			Hereditary and acquired taints.		
				No. of Cases.	Deaths from Consu'n	Percentage.	No. of Cases.	Deaths from Consu'n	Percentage.
Blood spitting prior to insurance	69	27	39.13	50	19	38.00	19	8	42.11
Bronchitis, pneumonia, or pleurisy prior to insurance,	202	47	23.27	155	34	21.94	47	13	27.66
Disease of hip, spine, or cervical glands in childhood,	20	4	20.00	19	4	21.05	1	0	——
Subject to asthma at the time of insurance,	47	14	29.79	38	10	26.32	9	4	44.44
Subject to cough at the time of insurance,	24	13	54.17	19	9	47.37	5	4	80.00
Subject to catarrh at the time of insurance,	16	6	37.50	11	3	27.27	5	3	60.00
Traces of former disease in the lungs,	13	8	61.54	8	6	75.00	5	2	40.00

Blood Spitting. The first group includes 69 cases in which there was a history of blood spitting. As this symptom has for many years been looked upon as a forerunner of consumption, all the cases mentioned must have been scrupulously investigated before policies were issued, but in spite of the care exercised in their selection 39 per cent. died from phthisis, and of the 19 cases in which an hereditary taint is added to the spitting of blood, 42 per cent. died from consumption.

Dr. Brannan has well shown, in compiling the statistics of the Washington Life, that "the significance to be attached to the spitting of blood depends mainly on the time that has elapsed since its occurrence" and the experience of the National agrees with his results.

Table H shows the interval between the blood-spitting and the time of insurance in the 69 cases.

Table H.

Interval between spitting of blood and time of insurance.	Number of Cases.	Deaths from Consumption.	Percentage.	
One year,	4	3	75.00	54.76%
Two years,	5	4	80.00	
Three to five years,	19	9	47.37	
Six to ten years,	14	7	50.00	
Eleven to twenty years,	15	2	13.33	14.81%
Twenty-one to thirty years,	12	2	16.67	

According to this table, the excessive consumptive mortality is limited to those cases in which the symptom occurred within ten years prior to the date of applying for insurance. Of these 54.76 per cent. died from consumption. In the remaining cases in which the interval was longer than ten years the percentage falls below 15.

Bronchitis, Pneumonia and Pleurisy. Referring again to Table G, we find a record of 202 persons who previous to insurance had had attacks of bronchitis, pneumonia or pleurisy; 23 per cent. of these died from consumption and of those who belonged to consumptive families nearly 28 per cent.

These figures confirm the common belief that individuals whose pulmonary tissues have been enfeebled by antecedent disease offer less than the average amount of resistance to the tubercle bacillus.

Disease of Hip, Spine or Cervical Glands in Childhood. The next class consists of 20 men who had manifested a strumous tendency as evidenced by disease of the hip, spine or cervical glands in childhood. Of these 20 men 4, or 20 per cent. died from consumption.

With a single exception there was no family taint in any of the cases. This one man, whose father died from consumption and who in youth had suffered from hip joint disease, died five years after he was insured from typhoid fever.

Asthma. Of 47 asthmatics about 30 per cent. died from consumption and of the 9 who inherited a predisposition to consumption, 44 per cent. died from this cause.

In view of the fact that most authorities ascribe long life and at least partial exemption from pulmonary phthisis to

persons subject to asthma, these figures are not a little surprising.

Cough. Twenty-four men were subject to cough at the time they were insured. Of these 54 per cent. died from consumption, and four out of five died from this disease, who also presented evidence of an inherited predisposition.

It is well to remember that these were all selected cases. Each case was subjected to the scrutiny of two physicians, the examiner in the field and the medical director at the Home Office, and the fact that they were accepted is evidence that at the time the cough was looked upon as of very little moment.

Catarrh. Sixteen persons stated in their applications that they were subject to catarrh. 37½ per cent. of these died from consumption; 5 also had a consumptive family record, of which number 3, or 60 per cent. died from consumption.

Traces of former disease in the lungs. In thirteen cases the examiners reported the existence of traces of former disease in the lungs. In the experience of the National these were mostly cases in which there was a history of pneumonia. Although recovery seemed to be complete and the applicants were apparently in good health, physical examination showed that the portion of lung involved had never fully returned to its normal condition. The death rate from consumption in this group was nearly 62 per cent.

The number of cases in some of the above classes is, of course, too small to render the results of very much practical value, but so far as they go these data point in the direction of an abnormally large consumptive mortality in all the different groups.

Acquired tendencies here referred to apparently exercised a pronounced influence as predisposing factors. This is well shown in Table I, which gives a classification of the whole 3,787 cases according to the presence or absence of acquired tendencies.

Table I.

	Number of Cases.	Deaths from Consumption.	Percentage.
Acquired tendencies,	391	119	30.43
No acquired tendencies,	3,396	536	15.78

More than 30 per cent. of the first group died from consumption and of the second less than 16 per cent.

According to Table J, a consumptive tendency acquired by the individual is to be construed as of more importance than is an hereditary predisposition.

Table J.

	Number of Cases.	Deaths from Consumption.	Percentage.
Hereditary tendency alone,	577	124	21.49
Acquired tendency alone,	300	85	28.33
Hereditary and acquired tendencies combined,	91	34	37.36
No consumptive tendency,	2,819	412	14.62

Of the cases in which there appeared an hereditary tendency alone about 21½ per cent. died from consumption.

Of those who gave evidence of acquired tendencies alone, 28 per cent. died from consumption. When both hereditary and acquired tendencies were present, 37 per cent. died from the same disease and only 14.6 per cent. of those cases which exhibited no tendency whatever.

IV. *Height and weight.* Having observed the importance to be attached to family history and to personal health record as indicating a susceptibility to consumption, it remains for us to consider the question of physique. The records of insurance companies afford information concerning the height, weight and chest measurements and from these data we judge of the physical characteristics, the build of the different individuals insured.

In the early days of insurance, however, not much stress was laid on physique in selecting risks and in 239 of the older applications these figures do not appear. Leaving these cases out of account, the average height of the remaining 3,548 cases was as shown in Table K, 5 feet, 7.76 inches, the average weight 155 lbs.

Table K.

Height and weight.	Number of Cases.	Deaths from Consumption.	Deaths from other causes.
Number of cases,	3,548	619	2,929
Average height,	5 ft. 7.76 in.	5 ft. 8.33 in.	5 ft. 7.67 in.
Average weight,	155.1 lbs.	143.4 lbs.	157.6 lbs.

The average height of those who died from consumption was 5 feet, 8.33 inches, while the weight fell to 143.4 lbs. It will be seen that light weight was a pronounced characteristic of the consumptive cases. The weight averaged 14 lbs. less in this class than among those who died from other causes.

The powerful influence exerted by weight upon the consumptive mortality is well shown, also, by arranging the whole number of cases in three groups as is done in Table L, according as the weight varies more than 5 lbs from the standard.

Table L.

Number of cases, 3,548.	Number of Cases.	Deaths from Consumption.	Percentage.
Weight above the standard,	1,322	70	5.30
Standard weight,	914	163	17.83
Weight below standard,	1,312	386	29.42

Only 5 per cent. of the over weights died from consumption, about 18 per cent. of the standard weights, and 29 per cent. of the under weights. The ratio of deaths from this disease was about six times larger in the third group than in the first.

Table M shows the bearing of weight when taken in conjunction with hereditary and acquired consumptive tendencies.

Table M.

Number of Cases, 3,548.	Predisposition, hereditary or acquired, or both.	No Predisposition.
	Percentage of Consumptive Deaths	Percentage of Consumptive Deaths.
Weight above the standard,	5.59	5.20
Standard weight,	25.91	15.67
Weight below the standard,	42.51	24.20

It will be observed that in the over weight group the presence of an hereditary or acquired taint increases the death rate from consumption only to a very slight extent. The surplus weight appears to offset the predisposition. But on the other hand, as the weight diminishes, as it falls to the standard and below, the consumptive tendency is greatly intensified. 42½ per cent. of the predisposed under weights died from this cause.

Chest Measurements. The influence of a slender physique as a factor in predisposition is seen also on studying the chest measurements in connection with height and weight. Table N is based on the experience of the National Life of Vermont alone, and as the chest circumference does not appear in many of the early applications, the number of cases is reduced to 1,454, of which number 253 died from consumption.

Table N.

	Number of Cases.	Deaths from Consumption.	Deaths from other causes.
Number of cases,	1,454	253	1,201
Average height,	5 ft. 7.2 in.	5 ft. 8.5 in.	5 ft. 7 in.
Average weight,	153.7 lbs.	143.1 lbs.	155.9 lbs.
Average chest circumference,	36.09 in.	34.49 in.	36.43 in.

The average height was 5 feet 7.2 inches; average weight 153.7 lbs.; chest circumference, 36.09 inches. The spare build of the consumptives is shown by the fact that, although they as a class were an inch and a half taller than those who died from other causes, the weight was about 13 lbs. less, and the girth of chest about 2 inches less.

In Table O the cases are classified according as the chest circumference is more or less than half the length of the body and also according to the presence or absence of a predisposition, hereditary or acquired.

Table O.

Number of Cases, 1454	No Predisposition.			Predisposition, hereditary, or acquired, or both.		
	Number of Cases.	Deaths from Consumption.	Percentage.	Number of Cases.	Deaths from Consumption.	Percentage.
Girth of chest less than one-half height,	264	68	25.76	104	47	45.19
Girth of chest more than one-half height,	781	94	12.04	305	44	14.43

The most striking facts brought out by this Table are (1) the powerful effect of a narrow chest upon the death rate from consumption, and (2) the varying significance of a predisposition according as it is, or is not coupled with a narrow chest. In the first group more than 45 per cent. of the predisposed cases die from consumption while in the second group, in those cases in which the girth of the chest equalled or exceeded half the height, the percentage falls to 14.4. A well developed chest appeared to counterbalance the adverse influence of the consumptive tendency, and on the other hand a narrow chest accentuated the predisposition.

For purposes of comparison the cases are classified in Table P, according as the weight is less or more than 2 lbs. for every inch in height.

Table P.

Number of Cases, 1,454.	No Predisposition.			Predisposition, hereditary, or acquired, or both.		
	Number of Cases.	Deaths from Consumption.	Percentage.	Number of Cases.	Deaths from Consumption	Percentage.
Weight less than 2 lbs. for every inch height.	194	49	25.26	100	35	35.00
Weight more than 2 lbs. for every inch height.	851	113	13.28	309	56	18.12

These figures confirm what has already been said concerning the influence of underweight.

Table R exhibits the combined effect of a narrow chest and light-weight.

Table R.

Number of Cases, 1,454.	No Predisposition.			Predisposition, hereditary, or acquired, or both.		
	Number of Cases.	Deaths from Consumption.	Percentage.	Number of Cases.	Deaths from Consumption.	Percentage.
Weight less than 2 lbs. for every inch in height and girth of chest less than one-half the height.	133	31	23.30	56	27	48.21

Of 133 non-predisposed cases in which the weight was less than 2 lbs. for each inch in height and the chest circumference less than one-half the length of the body, 23 per cent. died from consumption, and of 56 predisposed cases, 48 per cent. died from the same disease.

Directing our attention now to those 253 individuals who died from consumption, we find that at the time they were insured 89.3 per cent. had a chest circumference less than the standard, according to the table in common use. 77.9 per cent. were below the standard in weight; 23.3 per cent. had lost near relations from consumption, and 19.4 per cent. gave evidence of an acquired tendency. Less than one-fourth belonged to consumptive families, and nearly four-fifths were light weight.

In the experience of the Mutual Life of New York, according to the report published in 1877, nearly 80 per cent of those who died from consumption were under the average weight.

These figures would lead us to believe that in the majority of instances, consumption finds its victims among the spare and lean, and that the man whose weight is slightly above the standard and whose chest is well developed stands in very much less danger from this source.

Heavy men die from diseases of the heart, kidneys, and nervous system, but as a class they are at least partially exempt from consumption.

On the other hand the concurrence of a narrow chest and a weight very much below the standard is usually evidence of a feeble, delicate constitution, of poor nutrition, and an indi-

vidual of such physique is seriously handicapped in the combat with the infecting germ of tuberculosis.

Summary. In summing up, we may say that the facts ascertained indicate:

(1) That consumption, in proportion to the number living, is about as common at one age as another.

(2) That a consumptive family taint increases the mortality from this disease.

(3) That consumption in the parents is of greater significance than when it occurs among brothers and sisters.

(4) That "the number of individuals dying of consumption in the family of the applicant is of less importance than the degree of their relationship to him."

(5) That the average sum of vitality is less among those who come from consumptive stock than those who do not.

(6) That attacks of bronchitis, pneumonia and pleurisy, of asthma and strumous affections in childhood increase the risk from consumption.

(7) That so few overweights die from consumption that we are justified in regarding simple excess in weight as in a measure nullifying inherited or acquired tendencies, while a slender physique not only intensifies a consumptive tendency but is of itself a powerful predisposing factor.

DISCUSSION.

Dr. J. H. Jackson: *Mr. President, and Gentlemen of the State Medical Society*: I am sure that you will all agree with me in the statement that there remains very little to be said in regard to the subject which has been so ably presented by our President. I believe there is something in connection

with the study of Life Insurance which makes a man very exact in his statements and we can readily believe that this treat is not the result of anything else than severe and prolonged work in preparing such an excellent and complete paper on Tuberculosis.

If I were to speak of other conditions than those which have been mentioned it would take away from the force or from the enjoyment of what has already been presented. If I should say that the soil where the germ is received, or the mucous membrane of the mouth, is practically free, or enjoys almost complete immunity from the attacks of this bacillus I should be saying what I believe to be true, for while the bacilli may come in contact with the surfaces of these parts, there is constantly going on a cell change which aids the secretions in giving to the different individuals an immunity from the disease. If I should say that the mucous membrane of the lungs furnishes a better place for the development of the disease, or for the multiplication of the bacilli, I should be saying that which I believe is carried out in fact.

And what is this bacillus to which reference has been made? It is something that was not made known to many of us when we began the study of medicine. It is something that only a few years ago—perhaps ten or twelve—was first taught in the German schools by Germans themselves. The length of the bacillus is only about one-third of the diameter of the red blood-corpuscle, its diameter being much less than this, or one-fifth of its length.

Now this bacillus must have a soil where it may re-produce itself and the most favorable point has been found to be the respiratory surface. Here it reaches, sooner or later, the

lymphatic glands of the organ, and after a time suppuration takes place, or, from these glands before suppuration takes place, the bacilli may swarm—if I may so speak—to the adjoining glands until at last the disease is conveyed through the blood to every organ and tissue of the body. Investigation has shown that certain organs and tissues of the body are much less liable to become infected than others. The bladder and urethra, for instance, have a constant change taking place by the passage through them of fluids, so that these parts are less liable to be affected. In the intestinal canal and the ducts opening into it, the propagation of the bacilli is interfered with, and there is comparative immunity in these organs as well as in the healthy individual who in various ways exhales the same poison. We find the skin also is comparatively free from any tendency to tuberculosis although the blood may convey it to every organ of the body.

Now when the development has taken place, the individual who suffers most from the multiplication of germs and the effects of the disease, is the individual who by hereditary tendencies is unable to resist its influence. We also find that the individual who by his surroundings has reduced himself from the ordinary vigor which he once enjoyed, by his own excesses—not necessarily immoral excesses—but excess of overwork, improper surroundings, the breathing of impure air, the receiving of an improper amount of food, all these may favor the development of the disease in the individual. But Dr. Linsley will tell us that this disease may be readily propagated in some of the lower animals, while others have the power of resisting the bacilli. Which are these? The rabbit and guinea pig are often made use of for experiment. It is in them we

find a favorable place for its reception and propagation; while the dog is capable to a great extent of resisting it.

Now what can be done by us as medical men to prevent the development and spread of tuberculosis, for I suppose I may just touch upon this, although Dr. Grinnell will carry it through to its completion. (1st.) I think it would be a very good plan for each child if possible to select its own parentage; I think the mistake many children make is that they have not made such selection. It is doubtless true that the tendency to tuberculosis may be transmitted from parent to child, and that the tendency is visited "upon the children to the third and fourth generation." It seems to be a fact that the child of diseased parents is the child that has the least resistance to disease. In the one case there is a resistance to the disease, in the other case there is a hereditary tendency.

There is another thing that we need to teach the families with which we are connected and that is that pure air and wholesome food are necessary for the well being of individuals and for the prevention of disease in our Vermont homes. The child that is hired to do without butter because a larger sum of money is needed for the bank deposit, and the child who is asked to do without milk and to live largely upon coarse bread and water, is developing a tendency to tuberculosis. It is not that the parents would intentionally wrong the child, but they are laying a foundation for the propagation of the disease should he be attacked by it. Whatever we can do to increase the longevity of our patrons, should be a pleasant duty, as it should also be to teach them that good living, healthful surroundings, good ventilation, pure air and pure water—should

be as free as Heaven can grant them—and that these are the things which must be funished to those either with or without tubercular hereditary tendency.

I beg your pardon gentlemen for having said so much and I thank you for your attention. (Applause.)

Dr. Grinnell: *Mr. President and Gentlemen of the Society:* I would much prefer to postpone any remarks upon this paper until after the morning hour because I am well aware that in the morning we are to receive an additional article on tuberculosis in the lower animals and the origin of the bacillus; but the paper itself is so composed, and so many facts, and so many figures, and so many convincing things are given in regard to it that I feel constrained to say a word, and will not by any means attempt to add anything to what has been said by the President, or by Dr. Jackson. It will be consequently what they have already said.

A man who gets up statistics is to me a formidable being. We know in a general way that there are four millions of people in civilized countries who die every year of tuberculosis.

With this enormous mortality from this disease it is not strange that we all take a strong interest in the matter. When I consider how destructive is the disease, that it exists in all places, that when a piece of woolen cloth is saturated with it, though exposed to extreme heat or cold, yet the bacilli live, when I find a person in consumption, in whose expectoration, in a single day, millions of bacilli are discharged, and knowing that only one or two are necessary to start this trouble, I am only amazed that any of us are alive. It is not possible that any physician who has had a month's practice in the State of Vermont has not had some form of tuberculosis in

his cases. We are all of us exposed to it constantly and it is a strange thing to me that so few of us, comparatively speaking, contract it.

I think it has been well known and well understood by all the medical fraternity that the disease was contagious, and we have for many years known that the tendency of the disease to be carried from parent to child was particularly noticeable, and that the mother carried a greater tendency to the children than did the father. I see in the percentage given by the paper that the percentage is much smaller than I supposed it was. I was surprised too that the number of persons who die of this disease is so small where the history is that both parents died of tuberculosis. I supposed it was a much larger percentage if the children were exposed to the same surroundings as the parents were accustomed to. It has become so apparent to us that we have long since thought when a child's parents died of tuberculosis, that it was necessary for us to advise that the child should not live in the same locality where the parent died, before reaching the age at which the parent died.

There is one thing in the paper just read that I had not thought of so much before, but I shall in the future, and that is the peculiarity of weight. Now I was not aware that necessarily these under-weights were the ones that broke down of tuberculosis.

In conversation once with the President of an Insurance Company, the President said to me: "You Doctors are necessary to us in all probability," but, he says, "I do not care very much about what you say in your examination, provided when I look it over I find that the chest measurement is larger than

the abdominal measure. If the man's abdomen is larger than his chest, I do not want him." The statistics show that the man who had a larger abdominal measurement than chest measurement, was apt to break down with some disease of the liver and perhaps was addicted to the use of alcoholic stimulants. He said he selected the man who had the larger chest measurement.

I was not aware either that the measurement of the chest being less than half the height of the body, a man is a bad risk for life insurance. I shall remember that in my measurements hereafter.

The information that we get from life insurance is exceedingly valuable to us, and the Doctor is the "missing link," between the insured and the insurer. He has to be very cautious and careful in the examination of these men, and in regard to their history, and if there is any doubt whatever as to a case certainly he ought to lean toward the Life Insurance Company. I am appalled by the number of persons who have slipped in and are received by the companies and still die of this disease.

One other point I would like to say was a surprise to me. I supposed a person who had asthma had an immunity from anything else except asthma. I have never heard of anyone dying with asthma. I have supposed that was the great trouble with asthma, that they lived and lived on forever, and I cannot recall an instance, (and still there may be some) I can't recall an instance of a person with asthma who died of tuberculosis; but Dr. Bisbee states in this connection a large percentage of persons who have a history of asthma die of tuber-

culosis, and that persons with an asthmatic history would not be considered safe against the effects of the bacillus of tuberculosis.

This is a subject which requires much more discussion than can be given it to-night. I think that every member of this Society should add to the discussion, if not to-night, certainly to-morrow, and that the subject should not be left undiscussed. I did not expect to keep you at all to-night, and I am very much obliged to you for your courtesy and attention.

DR. C. S. CAVERLY: *Mr. President, and Gentlemen*; I agree most cordially with everything that has been said by Drs. Jackson and Grinnell about the admirable and complete preparation of this paper and the exactness of it. The figures in it I admire as much as Dr. Grinnell. We are all of us impressed with the figures that Dr. Grinnell has given us, that four million die every year with tuberculosis.

There is one point in particular in this paper of Dr. Bisbee's that has interested me and set me to thinking as I have listened to it and that is the influence of the bacillus tuberculosis on the hereditarily predisposed. I remember within a very few days of receiving from one of the large insurance companies, I think the Massachusetts Mutual, the usual book of direction for medical examiners in which one thing they state is about this: "Whereas formerly we have directed our agents to reject risks in which both parents died of tuberculosis, we will now consider such risks as that, and if there is any explanation to be made of the way in which either or both parents acquired the disease we should be very glad to receive it."

There is another point in regard to the disease which I have often thought the insurance companies would be led sooner or later to consider, and that is the matter of the existence of it in the immediate families. I have frequently thought that one of the questions that would sometime be on the insurance blanks would be: "Has the wife or the husband at the present time tuberculosis?" That strikes me as a very pertinent question to be in insurance blanks, as we understand the disease at the present time. Perhaps another form would be: "Has any present member of the family that disease?"

That is the only point that I have thought of to ask Dr. Bisbee, or to speak of here to-night as a thing that might creep into our blanks in the future.

Dr. Frederic C. Shattuck: *Mr. President, and Gentlemen:* I rise with great pleasure to express my very high appreciation of this paper which has been read to us this evening, both as to the amount of the work necessary in its preparation and the accuracy of the work. Of course this subject is of the utmost importance and these facts and figures which have been given to us are startling enough. Dr. Grinnell well says, "Why do not we all have tuberculosis?"

I have thought of late years that a great many people must have tuberculosis who do not know it and never know it, and who never come to the doctor. It seems to me there can be no question about it at all. I refer to pulmonary tuberculosis. We have in the first place a very strong post mortem evidence of that fact, and I do not believe there is the least doubt or question but that many have the disease without having a doctor's attention called to it. We must also remember that pulmonary tuberculosis is only one form of tuberculosis.

ADDRESS IN SURGERY.

BY E. M. POND, M. D., RUTLAND, VT.

Mr. President, and Gentlemen:

The science of Surgery may be said to date from the time when Sir Joseph Lister introduced the antiseptic treatment of wounds. Prior to that time suppuration was considered necessary in the healing of all wounds, and primary union the exception. This manner of healing prohibited work in parts where drainage was not perfect, thus the abdomen and large joint cavities were looked upon with awe, and any injury or operation upon them was as a result followed by suppuration and disaster.

It was demonstrated by Lister, that suppuration and various forms of blood poisoning were caused by germs which were introduced from without by dust in the atmosphere, dirty hands, instruments, or improper protection of the wound. To prevent this infection, the clothes of the operator were cleansed, hands and instruments disinfected, and a constant antiseptic spray kept playing over the field of operation. Antiseptics were used to irrigate the wound to destroy germs that might have gained access, and the wound covered by an ample antiseptic dressing. The principle of this method, although much modified, underlies the modern surgical treatment of wounds.

To-day, it is believed that asepsis, i. e., absolute surgical cleanliness is all that is required. To accomplish this, the modern operating room is built with a view to cleanliness, the floors, walls and ceilings so constructed that they can be scrubbed and disinfected, tables, trays and instruments are made of material that can be boiled or disinfected, the great carrier of microbes, the hands, and especially the finger-nails of the surgeon, have also had their share of attention, and to produce a condition of asepsis requires, *first*, soap and water, *second*, strong antiseptics, and *third*, sterilized water. With these precautions and the field of operation rendered aseptic and protected by sterilized towels, and the surgeon and assistant covered by sterilized gowns, we are in a position to do modern aseptic surgery.

By following these details the abdomen may be opened, diseased uterine appendages removed, large fibroid and other tumors extracted, and the field of operation closed, often without drainage.

The Trendelenburg posture has greatly facilitated the technique of pelvic surgery. Operations which were before difficult or impossible and done only by the sense of touch, are to-day, accomplished with ease, and each step of the operation visible.

But a few years ago the leading text books on diseases of women, taught us that it was impossible from examination to determine whether or no the tubes and ovaries were diseased. To-day any gynecologist would consider his examination most incomplete did he not know the condition of these organs.

Fibroid tumors were formerly said to be harmless and to disappear with the menopause, but by closer observation they were found to be more formidable, and often demanded surgical treatment. The mortality was at first so high that few were removed, the chief danger being the treatment of the pedicle and loss of blood. The mortality from intra-peritoneal treatment of the stump was very high, and the extra-peritoneal method often impossible, and when possible, required months to heal.

The ideal treatment for fibroid tumors and septic conditions of the uterus and appendages has at last been found, and rendered easy by Trendelenburgs posture, that is, total abdominal extirpation by ligation of the broad ligaments, the stumps being turned into the vagina and the peritoneum closed over them. Thus all ligatures, pedicles and raw surfaces are extra-peritoneal and perfect drainage is secured by gauze in the vagina.

The gauze packing in septic cases, as appendicitis and pyosapinx greatly reduces the mortality. Experience has taught that a gauze packing extending from the abdominal incision to the deeper parts of the pelvis, or abdomen, will become, in a few days, walled off by adhesions and become an extra-peritoneal cavity. While this, on account of its slow healing and subsequent liability to ventral hernia is not our choice, it is often necessary to save the life of our patient.

Cancer of the uterus, that most dreaded disease, was a few years ago, hopeless. To-day, if seen early, most cases recover by the improved technique of vaginal or abdominal hysterectomy.

The intestines are now under our control, thanks to the Czerney-Lambert sutures and improved methods of approximation by Senns' plates, and Murphy's buttons, and lateral anastomosis by the continuous suture of Abbe.

Work on the gall bladder is very striking. Before Murphy's buttons were introduced anastomosis of gall bladder and intestines was almost always fatal. To-day, we can, by their use, easily and quickly produce anastomosis with most gratifying results.

Drainage, which has always held so important a place, is now but little used in aseptic operations. Drainage tubes in aseptic surgery are to drain serum and blood, not pus. If the operation is aseptic, large quantities of blood do not require evacuation, as seen in healing of wounds by Schedes' blood clots.

Large quantities of blood may be present in a cavity, and if protected from infection, will become organized. We can fully appreciate the advantage of this in treating necrosed bone where large cavities are left. Formerly they were packed with gauze, which was removed after a few days and the wound allowed to granulate, which required months. To-day, these same cavities are made aseptic, the skin sutured and covered by Lister protective and an antiseptic dressing applied, which is not removed for two weeks.

The cavity fills with blood, it organizes and is then replaced by bone tissue. In this way primary union is secured by blood clot. While drainage, in abdominal surgery is still warmly discussed, good results are surely reported by those who but seldom use it, even when considerable blood and serum is left in the abdomen. Gun shot and punctured in-

juries of the knee joint were considered the most formidable of accidents, and early amputation was the only means of saving the patient's life.

To-day these injuries are treated by asepsis or free incision and irrigation, and not only the leg saved, but a movable joint in most cases. In Obstetrics, asepsis is most important. We cannot do better to illustrate than to recall the frightful outbreaks of puerperal fever that were prevalent but a few years ago in the lying-in hospitals of our large cities.

During the year from October 1892, to October 1893, the death rate in the New York Maternity Hospital, Blackwells Island, was 6.6 per cent. and in September 1893, reached 15.69 of all the women confined. At that time the antiseptic treatment was introduced when the mortality fell to .0018. In the Boston lying-in hospital it did not reach as high a figure, but was 4.58 per cent. which figure fell to .002, and in 1891, was .000.

In discussing this subject our neighbor may say, "I never use antiseptics and yet out of a thousand confinements, I never lost a case." We must remember two things, *first*, that in private practice our patients are not exposed to the germs of puerperal fever as in the large hospitals where it was prevalent, and *second*, that our neighbor does not tell us of the number of women he has left with mild infection, resulting in endometritis, salpingitis, ovaritis and pelvic or general peritonitis.

These mild forms of infection are very serious for the future health of the patient, and brings many a woman to the operating table before her former health is regained. The old, false custom of delivering a woman by touch and never by sight is a thing of the past. Now we fully understand how

important it is to know if lacerations of the soft parts are present, for neglect in their repair increases the liability of blood poisoning and means years of suffering for the patient.

We would call it poor surgery were we to leave a cut of the scalp, say two inches long, without antiseptic precautions, sutures or dressing of any kind, and yet many physicians leave women with tears in the cervix, vagina, or perineum, and never use sutures or even antiseptic measures. And when we stop to consider the close relation these parts bear to the peritoneum and general system, we cannot but appreciate how important good care is for the puerperal woman.

By the revival of symphysiotomy, craniotomy on the living child is at an end, and by the aid of the axis traction forceps, high deliveries which were before impossible without great force, are now easy. By washing the baby's eyes and introducing a few drops of nitrate of silver, the dreaded gonorrhœal ophthalmia with destruction of sight can be prevented.

At last the much dreaded disease, diphtheria, which has alike baffled the skill of the physician and the knife of the surgeon, is under control, and by a single injection of anti-toxine the most severe case can be cured in a few days.

Tubercular peritonitis was formerly universally fatal. Today, 80 per cent. or over, recover by simple laporotomy. By the experiments of Dr. Morris, during the last summer, it is claimed that during the operation the peritoneum becomes infected by saprophites, and that the ptomaine developed by them is poisonous to the bacilli.

The ptomaine from the germs of erysipelas acts in a similar manner upon the cancer cell in general, but most markedly

on the sarcoma. For example, a few years ago a woman was operated upon for carcinoma of the breast. There was great involvement of the axillary and cervical glands, but her weak condition prohibited their removal, and a rapid secondary growth was expected. Soon after the first change of dressing the patient contracted erysipelas and upon its subsidence, to the surprise of the surgeon, the glands had entirely disappeared. I had the pleasure of examining this patient and there were no signs of recurrence.

Dr. Colby mentions the following case of sarcoma, in which the injection of sterilized cultures of erysipelas were used. The growth extended from the scapula to the stereum involving the entire half of the chest. On account of its size and attachments, operation had been refused by several surgeons. Soon after the injection method the tumor began to subside and at present is but a small bunch on the scapula.

Typhoid fever, pneumonia and other diseases are at present being healed by anti-toxine, and while these may not be successful, it is but a question of time when most diseases will have their anti-toxines which will be specific.

For us to see at a glance the progress of surgery it is but necessary for us to visit any of the great cities and see the present operating room with all its neatness and modern aseptic appliances and contrast it with the old.

The Syms operating theater at the Roosevelt Hospital, in New York, as compared with the older part, is a fair illustration.

DISCUSSION.

Dr. J. B. Wheeler: *Mr. President, and Gentlemen*: I had no expectation of taking part in this discussion except perhaps in saying a few words some time in the course of it, until Dr. Bisbee informed me a few minutes ago that I was expected to open the discussion; consequently I do not feel prepared to do the subject justice at all, and I shall have to ask you to pardon me if the remarks which I make fall far below the standard set by the paper which has been read.

The subject which Dr. Pond has chosen is of course a very broad one and has been covered, I think, in a very satisfactory way. He has gone over nearly the whole ground and touched upon the most important points and has shown very clearly the difference between surgery as practiced to-day, aseptically and with modern improvements, and as it was before such improvements were introduced.

I think perhaps one might get an impression from the paper, that in order to do good work it is necessary to have the modern operating room with all aseptic appliances, that is, that the room and the machinery were necessary to the results. Now of course we must work aseptically or antiseptically in whatever place we work in order to get good results —in order to get the best results in the largest number of cases we must work aseptically, but in order to do this it is not necessary, although it helps a good deal, to have a room which you can wash out and have every modern appliance for the perfection of asepsis. These things are a necessity in large cities and in large hospitals and where the worst cases accumulate, but if we pay attention to the principles of aseptic and antiseptic surgery we can get good results in the operations we

perform in the country back on the hills, out beyond the bounds of civilization almost. Of course I do not mean to cry down the usefulness of the very best appliances. In the worst cases that can be imagined it makes a great deal of difference whether we have them or not, but in most of the surgery done in the country—and some of course is of very serious nature—good results can be and are obtained by men who work aseptically in little low rooms with whitewashed ceilings and papered walls and rough board floors, and where the antiseptic solutions have to be prepared from water that is not strained or filtered but taken right from the spring or out of the boiler on the stove, but which has been boiled and strained through towels, and perhaps further sterilized. The point is to be careful that we are clean ourselves and that we introduce nothing that is septic in the wound. Of course we cannot be quite as ideally perfect as we can in a room constructed specially for the purpose, but we have the purer air and the smaller amount of disease in the immediate vicinity to help us out.

I think a greater difference than the presence of aseptic and antiseptic appliances is made by the presence or absence of trained assistants. They, of course, are difficult to secure in an emergency in the country. In some few cases it makes all the difference, I think, between the patient's recovery and death; and yet the physician who understands antiseptic work can so impress his methods on untrained assistants as to get very good results, certainly far better than he would if he went ahead in the old way, though not perhaps so good as in the large city hospitals with the best of everything at his command.

Some of the points Dr. Pond touched upon are exceedingly interesting and perhaps would bear a little further elaboration.

The healing by the aseptic blood clot. I do not think anyone who has never seen a large bone cavity heal in that way realizes the difference between healing by the aseptic clot and healing by granulation. The main point in such cases is to be sure that the cavity is perfectly and thoroughly disinfected. Of course there are some cavities where we cannot be certain and it is better then to pack them with antiseptic gauze and change the packing when necessary, but when we have a bone cavity which we can be sure is perfectly disinfected, if we allow it to fill up with blood and catch the skin over it with an occasional stitch and apply an antiseptic dressing over that, I think if we have never tried that before we should be very much surprised at the rapid and perfect result of the operation. The recovery is a matter of weeks instead of months as it is by the other treatment when the wound is allowed to heal by granulation.

I do not recall any very extended mention in the paper of the modern treatment of appendicitis which seems to me is one of the most marked advances made by surgery in the last few years, and by which so many cases which we were in the habit of losing have been saved and not only recover from the operation but recover from it in such shape as never to be troubled with the disease again.

I do not know that I have anything more to say, Mr. President, in the discussion of this paper. It has, I believe, covered the whole ground and covered it admirably and the

few points which I have called out are simply such as happen to occur to me as points that would bear a little more elaboration.

Dr. J. C. Irish: *Mr. President, and Gentlemen*: Dr. Pond has called out in the introduction of his address several matters that I am afraid I am going to repeat to-morrow. In short, I am going to say very much the same thing he has in regard to fibroids and cancers, and in the matter of drainage after an abdominal operation—which I think is very necessary, and in regard to the appliances in regard to any particular case, the care lest we introduce any foreign substance like a broken down blood-clot, that it is, in this case not safe to leave that abdominal cavity undrained. Whenever the operation has been such a one that we may reasonably consider it aseptic, I do not think drainage is required. If the operation is aseptic that blood will take care of itself, it does not affect the patient.

One word in regard to the matter of operating in private houses. In my own experience, and I have had a good deal in that work, we can get very nearly as good results in private houses as in hospitals. Take a particular room in the house and clear it of all unnecessary articles. It can almost always be so cleaned as to be a perfect operating room, then when we get to operating in one of these rooms, if we get sepsis, we get it from the surgeon, or the instruments, or the nurse, or the assistants. The room itself can be made perfect, as a rule, for operating purposes in country houses.

Dr. J. H. Jackson: *Mr. President, and Gentlemen*: I feel a great deal of diffidence in saying anything upon the subject so ably presented by our Vice-President. I only will say this, that I am surprised every day at the wonderful improvement in surgery—in every branch of surgery—which has taken place from the time of my study of medicine, or the beginning of my study of medicine, and the success of operations to-day as so well stated in the address, and the results obtained from these operations. To me they are little less than miraculous.

Where years ago we were taught—some of us older ones—that laudable pus was the only proper result from surgery, we now see repeated operations, and no pus whatever resulting. I say, it seems to me, that if there is anything in the science of medicine and surgery of which we to-day should be proud, it is antiseptic work in surgery, and I am glad that this paper has been presented to us this afternoon and I should be very glad to hear from every surgeon that we may continually render greater service to all patients who come under our care.

PUERPERAL CONVULSIONS.

BY GEORGE DAVENPORT, M D., EAST RANDOLPH, VT.

This paper I have the honor to present you for discussion at this meeting, is in relation to a formidable disease which attacks the pregnant woman either at, or before, or after the termination of pregnancy. There is so much that might be said on this subject, its ætiology, its symptoms and its treatment, that it becomes positively embarrassing to decide at what point to begin. Consider if you please, the social conditions of the patient. Young, just starting in life. Everything to the eyes of the young people bears a roseate hue. They dwell in blissful ignorance of the dark lowering clouds which are settling nearer and nearer upon them until they are enveloped in the most appalling darkness, it may be of death itself. I say young because almost every case of puerperal convulsions occurs at the birth of the first child. In Dr. Collins' 30 cases 29 were first children. Dr. Merriman had 36 cases of which 28 were first labors. More than two-thirds of Dr. Ramsbotham's cases were with first children and we know from our own observation that nearly all we have met with were first labors. In a thoughtless moment I promised to prepare a paper on puerperal eclampsia for this meeting; perhaps I did not realize the difficulties to be encountered in trying to harm-

onize the views of the different authors who have written upon this subject so as to make this a plain practical paper for our mutual benefit. Modern writers devote but little space to the discussion of this subject; they touch it gingerly. When the student has read all, both ancient and modern, he has very much to learn yet, at the bedside of the patient. Dr. Dewees describes three forms or grades of eclampsia, which to my mind, are both truthful and convenient and I propose in this short paper, to present to the society for discussion, several cases illustrating the different phases of the disease which attacks, and attacks only, the parturient woman; discarding theories and contenting myself with facts. These forms or varieties are *first*, The Hysterical, not often seen in the country, *second*, The Epileptic, altogether the most common to be met with of any form, and lastly, *third*, The Apoplectic, the most fatal of all to the mother, and sometimes I am inclined to think every case fatal, absolutely no recoveries whatever.

My first case was observed on the 4th day of August, 1854. Mrs. D—— aged 16 years, with light complexion, blue eyes, short in stature, plump and well nourished. I never saw before or since a patient with so much œdema. The skin fairly glistened from the "soles of her feet to the crown of her head." I was called early in the morning and found her quite comfortable with slight labor pains becoming regular. Digital examination disclosed the os uteri soft and dilatable, a head presentation and no indication whatever of any trouble. She was in first rate spirits, making sport of having a baby when so young. Everything seemed to be going on well until the os was dilated to the size of a quarter of a dollar, when without warning, sport and jollity gave way to shrieks and lamentations,

from the first convulsion. All now was terror and confusion; very soon after she had another spasm. In the meantime I procured a piece of soft wood to place between the molar teeth to prevent injury to the tongue. This is not difficult, for at the beginning of every fit the mouth is opened to its utmost extent. Mrs. D—— became entirely unconscious after the first convulsion and remained in that condition from Friday morning until the following Tuesday. Examination showed the labor to be going on normally and as expeditiously as could be expected in a primipara. We sent for the late Dr. C—— as counsel, and while the messenger was gone I took from the arm about 12 ounces of blood. Prof. Bartlett in his lectures used to say the obstetrician needed but little more in the practice of his art than the lancet and a bottle of morphine. Poor man! how sad to think he died in ignorance of the use of carbolic acid and bichloride in the practice of midwifery! A great difficulty was encountered in my efforts to find a vein—bear in mind that I was but a tyro in the business—on account of the prodigious amount of œdema. I could locate the vein only by the sense of touch with the point of my finger. Fortunately I struck it exactly right at a depth of at least one-half of an inch. The labor was progressing rapidly and about the time Dr. C—— arrived I delivered her of a fine healthy female child. Dr. C—— immediately gave her one drachm of laudanum. Her tongue by this time had become so swollen from the injury received at the first spasm that we could give her but little medicine afterward. The lips however were often wet with water. I asked the attendant nurses to keep an account of the number of convulsions and they did so until they numbered thirty-eight. On Sunday they lost the tally and

they were not recorded after that. She must have been convulsed more than fifty times. The pulse all this time did not exceed 100 per minute and there was but a slight increase of temperature. On Monday a strong mustard paste was applied the entire length of the spine. She regained consciousness the next day, Tuesday the 8th. Mrs. D—— was up and about the house as well as usual, when the baby was two weeks old. A prodigious quantity of urine was passed while the œdema remained. She made an uninterrupted recovery. I regard her case as typical of the epileptiform variety of puerperal convulsions. The number of the spasms was certainly extraordinary. No one of the older authors places the number at more than 18. Prof. King mentions the extreme as 30 or about that in any case. Just a word as to the management of such cases: When the head is pressing upon the perinæum and you think the child is about to be born, hold back the head until the fit has passed and the rigid muscles relax, then flex the limbs by the aid of assistants and you can readily deliver without injury to either mother or child.

Case 2. Mrs. N—— primipara, blue eyes, well nourished. Was called to attend her on one of the coldest nights of a cold Vermont winter, found a head presentation, labor normal not protracted. After the uterus was emptied and before the soiled clothes could be removed she had a severe convulsion, soon followed by another. My first thought was to treat her as Mrs. D—— was treated. I accordingly bled her to the amount of perhaps 16 ounces and gave a full dose of morphine. The fits did not cease immediately but continued a few hours and she was convulsed altogether ten or twelve times. She was unconscious about twenty-four hours.

There was very little œdema. The result was a perfect and rapid recovery. This proved to be of the same type as the first case but much less severe.

Case 3. Mrs. S—— primipara, light blue eyes, a plump well nourished person. This was a case unique in my experience. With the very first pain she fell to the floor in a convulsion. She became unconscious and remained in that condition for several hours after the birth of the child, but when the uterus was emptied the convulsions ceased. About eight o'clock the next morning I asked her how she found herself. She replied: "Doctor I just as lief have a baby as not. They told me I should suffer great pain but I haven't had a particle of pain all through it and here is my baby." Every labor pain was accompanied by a spasm. Both mother and child made a speedy recovery. The treatment was bleeding and full doses of morphine. What was the pathology in this case? What destroyed the balance between the nervous and muscular systems? I consider this case a fine specimen of reflex action consequent upon an irritable condition of the uterine nerves. This case as well as the preceding happened in exceedingly cold weather. Dr. Churchill thinks convulsions more apt to occur in warm weather especially if there is much electricity in the air. According to my observation in this locality, the weather has nothing whatever to do with it.

Case 4. Mrs. K—— primipara, farmer's wife, blue eyes, tall, large boned, very strong and well nourished. In this case the convulsions did not come on until several hours after the labor was completed. The shoulders and arms were convulsed much more than the lower limbs. It is now about twenty-five years since Mrs. K—— had this illness but she has never been

able to raise either hand to her head in a natural manner. She has given birth to several children but has had no more convulsions. She was bled moderately, and had anodynes and anti-spasmodics. Retention of urine was a marked feature in her case. The infusion or tincture of Digitalis as a diuretic and heart tonic is a favorite remedy with me in nearly all conditions incident to the parturient woman. This patient made a good recovery though rather slow. Was this a case of partial paralysis consequent upon a serous effusion on the brain?

Case 5. Mrs. G—— primipara, light hair, blue eyes, medium size. After the child was born she was seized by a well developed convulsion. I took blood as soon as I could and gave her a dose of morphine. Luckily she had no more spasms and she was unconscious but a short time and made a rapid recovery.

Case 6. Mrs. B—— aged 19 years, light complexion, blue eyes, found patient on my first visit suffering intense neuralgic pains in the back and also in the region of the uterus, had passed two menstrual periods without show. One week previous in lifting a heavy weight had felt something give way and she has now a dark bloody discharge from the uterus. Digital examination disclosed the womb slightly enlarged, the neck abnormally elongated and small and to the touch it felt as if a string or small cord was drawn tightly around it at its junction with the body of the uterus. Mrs. B—— had invariably suffered intensely at every catamenial period. Dry cups applied to the back, feet in hot water, chloral and the bromides usually gave relief to the dysmenorrhœa but now had little or no effect. May 8th, a trifle easier, continued treatment except the dry cups. 9th, pains more severe and simulated labor pains.

First convulsion, to-day, followed at intervals by several others, but no coma. She was bled ten or twelve ounces and inhaled chloroform with good effect—she could not take morphine. Longer intervals between the fits, was obliged to discontinue chloral and bromides. Retention of urine, gave diuretics. The using of the catheter caused much pain. Urine strongly ammoniacal. There was not much change in the symptoms on the 10th, 11th and the 12th. On the 13th I told the husband and the mother the uterus must be emptied of what we believed to be a fœtus of two months, before relief could be obtained. The bloody discharge still continued and the abortion was a foregone conclusion. The os was found softer and more patulous but the constriction as bad as ever, nevertheless dilatation was attempted and after many trials (the patient being under the influence of chloroform) the constriction was dilated sufficiently to allow the use of the placental forceps to extract the fœtus, which being accomplished, the pains ceased and she had no more spasms and made a good recovery with no untoward symptoms. I told Mrs. B—— she would pass her next monthly period free from pain, she was incredulous at the time but it proved true. Here was a bad case of dysmenorrhœa very effectually cured. She has since borne two strong healthy children. We have in this patient a case of genuine puerperal eclampsia in an abortion at, or near the beginning of the third month of pregnancy. How will the theorists account for it? Were the brain and spinal marrow at fault or was it albuminuria? Was it not due rather to a peculiarly sensitive condition of the uterine nerves propagated through the whole spinal system? Writers discussing this disease seem to have no clear definite ideas as to its pathology. We all

know to a certainty, eclamptic convulsions attack only the parturient woman. Ramsbotham says the most usual cause is pressure upon the brain. But he did not explain how that could happen in an abortion at three months. He also says the disease has often proved fatal without any organic lesion being evident on dissection and mentions several cases in which he believes the cause was irritation propagated immediately from the uterus to the brain. Authors are not very well agreed as to the remote or proximate cause. Some claim it to be the result of, and dependent upon albuminous urine, a sort of nephritis, while others believe it closely allied to apoplexy and still others to an anæmic condition of the blood vessels of the brain or all of the above mentioned pathological conditions mixed and mingled and finally resulting in eclampsia. According to my observation, the remote cause of eclampsia is an impregnated uterus and the exciting cause labor pains—an effort of nature to relieve itself of what constitutes an offending body in a given case and why convulsions are present in one patient and absent in another no pathologist can explain. In this connection permit me to contribute my mite of what I deem to be facts concerning this disease. Every patient I have seen has had blue eyes or more often pale blue eyes, light colored hair and would be classed in temperament as nervo-lymphatic. The figure may be stout or thin, tall or short, but the temperament of eclamptic patients is always the same. For many years I have borne it in mind that when called to the bedside of a woman in labor and I saw that she had dark hair, and dark eyes, I felt assured that whatever complications might arise she was safe from the always to be dreaded convulsions. Convulsions do not follow

difficult and lingering labors, on the contrary all of my cases have been easy normal labors. Cazeau says the head almost always presents. In all my cases the head presented in first position of Baudelocque, the labor was rapid and the "fits" did not appear to retard it a particle. That being the fact it would be unwise to rush for your instrument bag at the first onset of the convulsions. We may all see there is nothing malignant about eclamptic paroxysms. It is marvelous how quickly a patient recovers from an attack of it. She is entirely unconscious and consequently suffers no pain to reduce her strength. Writers generally over rate the mortality of convulsions. I believe that in the hysterical and epileptiform varieties, it is almost never fatal. In order to make this paper as complete as possible I will describe a fatal case—the first and only one in my practice—of the apoplectic variety.

Case 7. Mrs. R—— mulatto, fine form, medium size, deep blue eyes, hair dark and curly, fourth child born after a comparatively easy labor. About thirty hours afterward had a "fit." I found her in a profound comatose state, stertorous breathing, no motion whatever in the muscles of the limbs, and no motion of any muscles except the respiratory; no frothing at the mouth and no more fits, thus she remained until death closed the scene. Mrs. R——'s husband was a white man. I discovered at the birth of the first child that she was not a physically perfect woman; the breasts had no nipples. The mammæ were perfect in size and shape, but no appearance of any nipples, the skin as smooth in one place as another. This woman was bled moderately, had counter-irritants, but died next day.

I think this was a case of genuine apoplexy and just as fatal in a lying-in woman as in any other person. The above are all my own cases, but I have seen as many more in consultation, but these are sufficient to show the different types or forms of the disease. The correct statement of the prognosis will depend upon our ability to discriminate between the epileptic and apoplectic forms of the convulsions, if of the former we may be tolerably certain the patient will recover, but if of the latter it is commonly fatal. Some authors mention a form of what is called serous apoplexy, an effusion of serum within the calvarium which may be absorbed and the patient recover. I am tempted to quote Dr. Churchill, who says: "The entire and persistent insensibility, the absence of repeated paroxysms with accompanying symptoms, will at once enable us to distinguish apoplectic from hysteric or epileptic convulsions." In this form it is invariably fatal. We believe it is only a small percentage of all the cases which assume this fatal aspect.

In the treatment of puerperal eclampsia I believe the consensus of opinion (both of European and American physicians) at the present time, favors the abstraction of blood. With our present knowledge of the disease this opinion appears to be not only theoretically but practically correct. Usually the attacks come without warning, therefore it is well to be prepared and if possible bleed before she has the second spasm. The quantity to be taken will be subject to your own judgment in a given case and the sooner the blood is taken the better for the patient. From 8 to 16 ounces is amply sufficient. You do not bleed with the expectation of stopping the spasms immediately, but more as a precautionary measure. You see

that by bleeding you diminish the volume of blood and by just so much lessening the danger of engorgement and also by so much diminishing the danger of converting an epileptic into the fatal apoplectic convulsion. I would like to say, but I scarcely know how to express it, that our authors and instructors dwell too much upon trying to stop the convulsions, and have advocated very heroic treatment in bleeding and in the use of morphine and chloroform. Some of them instruct us to bleed 20 or 30 ounces, some from 40 to 50 and even to 60 ounces, and one author has bled a woman 70 ounces. It would be interesting to know the result in the latter case. In my opinion to practice the profuse blood-letting advocated by them would be unwise in the extreme. It is not necessary. The spasms do not kill the woman, if they did my first case ought to have died within forty-eight hours after the first attack. It is well understood the parturient woman bears bleeding better than any other class of patients, but that is no reason why she should be bled to death in order to stop the convulsions which are not essentially injuring her. The after treatment is chiefly morphine when it can be borne. The bromides and ordinary nervines may possibly be of some benefit. In the use of chloroform we must remember the woman is already under the influence of a powerful anæsthetic and is entirely unconscious therefore chloroform is to be used with great care lest the remedy be worse than the disease. In several instances I have observed a slight twitching of the muscles in the woman when she is "having a pain," to give an opiate immediately is the proper remedy. Another valuable remedy is to be noticed and that remedy is time. Do not hurry if you find the temperature about normal and the pulse ranging less than one

hundred to the minute; your patient will recover. The opiate will soothe after a time the irritated nerves, but time is necessary. A great many things may be done for the patient, in the way of nursing which will tend to keep the attendants busy, an important point, which does no harm to the sufferer, and above all, "don't lose your head." A few words in regard to another mode of treatment advocated by Dr. C. C. P. Clarke, of Oswego, N. Y., in the July number of the *American Journal of Obstetrics*, 1880, in which he advises and recommends very large doses of morphine administered subcutaneously and claims superior success. He says he would give one and a half to two grains of morphine at one dose, have it weighed out by the apothecaries' scales, and adds if a man is timorous his first dose may be only one grain but the two-grain dose is the proper one. I mention this so that if any gentlemen present has tried the large doses of morphine he may tell us what he thinks of this mode of treating puerperal eclampsia. I claim to have been sucessful in my treatment of this fell disease, so does Dr. Clarke, and so do you perhaps, all of which goes to prove what I have before stated, that puerperal eclampsia is not so fatal a disease as the old writers taught and the profession have been accustomed to believe.

DISCUSSION.

Dr. H. R. Wilder: I would inquire of the Doctor if there was present albumen in all cases?

Dr. George Davenport: I supposed that albumen had a good deal to do with it but find that is not so in half of the cases.

Dr. H. R. Wilder: I was going to remark in connection with this subject that it seems to me that albumen in the urine of a pregnant woman is not at all uncommon, but when we find that condition to exist in the early part of pregnancy—if of any great amount—it is a matter of serious omen and should be looked after very carefully before the period of delivery; and why I brought up the question in regard to these cases named by the Doctor, it may possibly have been that albumen was present and the Doctor's attention was not called to it. It often happens that that goes along and indicates an inactive condition of the kidneys and if there is much albumen present in the early stages of pregnancy it becomes the duty of the physician to take means to relieve the system by keeping up as favorable action of the kidneys as possible. It often becomes a condition of uremic poisoning, in a great many cases of eclampsia, and by treating the kidneys great benefit is derived.

We all admit the benefit of blood-letting. It is a temporary relief to diminish the volume of the pulse and in that way possibly the condition of the congested kidneys and relieve the blood of an amount of urea that is poisoning the nervous centers. It is the most reliable source of relief that we have to give at the present time. We need to use remedies to calm the nervous system. Bromides and chloral I have found to be useful, but frequently have combined morphine with them with a view to controlling the nervous irritability and I think that in a sense is very important. And then, of course, there should be means taken to relieve the congested condition of the kidneys, possibly by warm baths and warm applications and in every way should we favor the excretion through the

skin of this urea, perhaps by pilocarpine or some medicine of that kind.

I note it is recommended we should in every way favor the action of the skin and kidneys while we are using this temporary means of relief.

Dr. O. W. Sherwin: I have no doubt a great many volumes have been written about puerperal eclampsia and that many are still to be written, but I do not think we yet know the poison, or that it is any one poison that produces it. I think it has been thoroughly shown that it is not urea. Urea is eliminated from the system so rapidly that it does not produce poison, but however that may be, whether it is urea, ureatic acid or some other poison, the best we can do at present is to favor the elimination of this excretory production by the way of the skin and kidneys.

Twice within the past year I have succeeded in relieving the patient by the use of pilocarpine, once where the patient had been bled. This case was one of pregnancy of five months with severe convulsions and it was most desirable that the pregnancy should go on and we decided to try pilocarpine. The attendant physician every other day gave a copious sweat by pilocarpine for some three or four weeks, and occasionally after that, and pregnancy went on with no bad results—no convulsions.

I have seen two cases within the past year of the albuminuric form of eclampsia—one of death and one of recovery. Both cases—the one that recovered was a case of my own and I was called not knowing I was to attend the case, there having been no examination of the urine made. By the way in the other case delivery was effected during the unconsciousness fol-

lowing the first attack, anæsthetics not being necessary. There was one attack afterwards but no further attack; the patient made a good recovery. The second case was the wife of a physician and she had been so well and the Doctor being away at the time, his attention was not called to the matter of possible kindney trouble; but during labor she was seized with convulsions and remained so until her death. I found on examination of the urine evidences of kidney trouble having existed before she died.

I think, with Dr. Wilder, that blood-letting may in all cases be a temporary relief. Of course we take the best blood as well as the poisoned blood but we relieve the system of so much poison for the present. I think the use of pilocarpine will become more general than it has heretofore. I think it has effect otherwise than on the skin—the general depressing effect will help some about the convulsions.

I would urge one thing and that is that when spoken to and engaged to attend a case of child birth that we should tell the patient a month before confinement to send a specimen of urine to be examined, and carefully watch the case until the patient is confined. In that way we should gain and accumulate more knowledge about these things. In most cases I know we physicians when spoken to put it on our note books—make a memorandum of it and perhaps we do not think any more about it—forget all about it—until we are called, and in the meantime the patient goes along perhaps with kidney complications and does not know anything about it and we do not know anything about it until suddenly called and find the patient in convulsions, perhaps too late to be of use, and we know nothing about the case or about the length of its standing,

whereas by taking advantage of that time when patients call on us or speak to us about it we may accumulate some knowledge in regard to these things that may be useful to us. I do not think Vermont Doctors are behind others in this respect, but this matter has been allowed to go along a little too loosely —nobody seems to know much about it, and what we want from year to year is to accumulate a little more knowledge in regard to it.

Dr. J. H. Linsley: I think we all know about the symptoms we get from the retention in the blood of secreted products, and furthermore that it is not proved that that product is urea. At the same time urea is the exponent of these products whatever they are and it seems to me—or my experience is that many physicians are too apt to place dependence upon the amount of albumen as indicating the gravity of the case. Now I do not believe this is so at all. It is possible to have, as you all know urine that will have albumen and a considerable quantity of urea and the amount of albumen is of no consequence particularly except as it indicates an inability of the kidneys to discharge urea or substances that make urea. The great thing that we should aim to know is the amount of urea discharged in twenty-four hours. Now although it is a very simple thing yet I think there are comparatively few physicians who know absolutely the amount of urea discharged. Of course I do not mean within a few grains, but it is a matter of great consequence to know approximately and it is impossible to tell except by a quantitative test. Such a test should always be made.

Dr. H. R. Wilder: In one case I examined, one-third of the normal amount of urea was excreted.

Dr. J. H. Jackson: Not having heard the entire paper I may in my remarks go over some points that have been already made.

This disease is the dread of every practitioner. We think of it I suppose, in every case of labor which we attend, and those of us who have seen one case sincerely hope we shall not live long enough to see another.

There is something fearful in a convulsion whether of adult or child, but in what should be a physiological condition, surely, to have the accompaniment of convulsions, gives us an awe and a dread, and we know also that every case is liable to be fatal.

My first experience with puerperal convulsions was when I was twenty-one and although I called counsel early it was not advised that blood-letting should take place. The result was that in a few hours, although delivery was accomplished, death resulted. Now since that time I have known personally of eight cases—not all my own I am thankful to say—in six of which cases blood-letting with the free use of pilocarpine and calomel were resorted to. In the other two cases blood-letting was not made use of nor were the other two remedies. In these two cases the dependence was put upon the anæsthetic until delivery was accomplished. These two cases were fatal. The six cases in which blood letting was resorted to all recovered.

Now I do not mean to put too much stress upon the blood-letting, but I give you the experience for what it is worth.

When we find a case of puerperal convulsions it is usually in a case that we have not been called to attend previously; we have not had an opportunity to examine the urine to know whether there is albumen present. It is before the patient

is expecting to call a physician, as a rule at seven months, and the result is that we have to take the situation as we find it—called hurriedly—a woman in a fit—when we arrive we find we are unable to administer remedies of any kind for a time, but we may use the vene section—we can always open a vein, and I believe that this remedy applied promptly is of benefit; that it does relieve, as Dr. Sherwin has said the entire system, both of good and bad blood; that it is a relief to the central nervous system; that it is a relief to the arterial system. In three cases that I recall, and by the way, I have a record of these cases, no convulsion followed the first blood-letting.

When I speak of the calomel as an additional remedy I speak of no new means of relieving the system of that condition or of that accumulation which has given rise to the convulsion. It is not a rapid remedy but it is doing its work while you temporarily make use of the blood-letting. Now it seems to me with these four remedies, the blood-letting, because we can resort to that at once in most cases, and in every case that I have seen I would do it—the blood-letting, the anæsthetic, the pilocarpine and the calomel, in these we have remedies which go further than anything else I am acquainted with towards saving the patient. Of course I take it for granted that every physician will dilate the cervix and deliver as soon as possible.

Dr. E. F. Upham: I do not expect to have much to add to what has already been said. It has been my fortune to attend quite a number of cases of puerperal eclampsia but I am not able to tell you how many—havn't that in mind—but it has seemed to me there are different causes—I have come to believe in my own mind firmly that there are different causes that produce the epileptic convulsion.

When we have as in some cases an over-fullness of the vessels I certainly would use blood-letting—not with a view of eliminating the poison from the system but to eliminate the quantity. I think in many cases that will undoubtedly relieve, I think I have seen it relieve.

There is another class of cases that doubtless comes from the effect of the accumulation of urea upon the nerves and communicated to the nerve centers. The face may be flushed to be sure and is liable to be but in that class of cases my observation has been that if the blood-letting has been used the patient has made a tedious recovery, if recovery at all—that that was not the cause and rather than destroy it, it seems to me I would supply it if possible. In that class of cases I should rely upon nervines, and where I have been called I have more frequently used an anæsthetic in some form; but it seems to me that the only way is to study the individual case.

As Dr. Jackson has remarked in a large proportion of cases it is unexpected. We have not had a chance to see whether our patient has excessive urea, or albumen. Occasionally we do, but it seems to me that in very many cases the only thing needed is quiet. The nervous system needs quiet and the general tone of the patient needs to be invigorated.

THE RECENT TYPHOID FEVER EPIDEMIC AT WINDSOR, VT.

BY J. D. BREWSTER, M. D., WINDSOR, VT.

In compliance with the request of our Secretary and others, I will endeavor to give a brief account of the epidemic of typhoid fever, which prevailed in Windsor, last spring. The first case was reported March 15th, and was in a family who resided at the extreme southern limit of the village, and at the time there could not be found any apparent cause for the disease.

No further case appeared until March 24th and 25th, at which time, a large number of people were taken with high fever, which soon showed itself to be unmistakably typhoid fever. These cases were among all classes of people, the rich and poor alike, but all within the village limit.

Observation soon showed the disease was confined entirely to families using the village water supply, those having wells being entirely exempt, except in cases of children who drank the water at school. This fact led immediately to the examination of the water system. Windsor was supplied by a series of springs situated about two miles or more from the center of the village; these springs formed a small brook, which ran

along a small valley for about a mile, passing six farms and dwelling houses, and then emptying into a reservoir, from which iron pipes conveyed the water into the houses. Now about forty rods above the rise of the brook, a farm house is situated, where it was ascertained a person had suffered the previous January, from a feverish condition for about four weeks. It was supposed to be a non-infectious form of fever, and was not reported to the Board of Health, and consequently no care was taken of the discharges of the patient, and they were thrown into the vault. To make matters worse, the sink drain was frozen at the time, so all wash-water was thrown out upon the snow. During the very warm weather which we had the first week in March, the snow melted, and all this accumulation easily found its way into the brook, and thence into the reservoir, and our homes. This explanation was unanimously indorsed by the State Board, who made an official visit to the place soon after the outbreak. The Local Board at once issued orders to have all water for cooking or drinking purposes boiled. At the same time the town provided a water cart to deliver water at the houses from an adjoining spring.

From March 24th to 30th, about eighty cases were reported. From this date to April 27th, the cases became less frequent, this time being probably the limit of the primary cases, the later ones being secondary, and mostly occurred in families already suffering from the disease. Up to July 28th, there were 130 cases, these occurring in 68 families, the largest number afflicted in one family being five, the majority only one. The ages ranged from 10 months to 92 years, but the majority were under twenty years of age, and a large per cent. were children, who withstood the disease to a remarkable

degree, even with a protracted evening temperature of 104. The population of Windsor is 1300, so about 10 per cent. of the inhabitants were affected. We were fortunate in having only seventeen deaths, or 13 per cent.

Six of the fatal cases had intestinal hemorrhage.

One died from perforation.

S. H., 44 years old died from complication of erysipelas.

Mr. V—— had temperature of 106 degrees at death, and there was a rise of a degree a short time after.

M. K., a girl 14 years of age was afflicted with infantile paralysis. She died in the tenth week, and at death, had seven bed sores, those on hips leaving bone exposed, which was also carious.

Three died before end of second week, the average fatality about end of 3d, or beginning of 5th week.

I will now give a brief history of a few of the cases which have recovered. Perhaps the most remarkable one, is Mrs. C——, about thirty years old. She showed all the symptoms of typhoid fever, coated tongue, enlarged spleen, rose spots on abdomen, etc., but developed *no* fever until 51st day, when evening temperature was 99 degrees, ranging from this to 99 5-10, until 63d day. Convalescence being very protracted after 13th week.

A. A—— aged 70, had typhoid symptoms, with evening temperature of 103 to 105 degrees, with croupous pneumonia, rusty sputa, which continued to 12th day. From 14th to 21st, no fever, from 22nd to 32nd, average temperature 102 degrees, symptoms wholly abdominal, rose spots present. Tempera-

ture normal to 40th day, from 40th to 54th day fever highest, temperature 101 degrees. Symptoms, catarrhal pneumonia. Convalescence protracted.

C A—— had relapse on 21st day with remarkable eruption, some 30 or 40 large papules which soon became vesicula, and many of them pustular, while one was a true adenitis, which went on to suppuration, containing ½ drachm of pus; this was certainly due to sepsis. This same case at beginning of convalescence had suppurative otitis media and inflammation of mastoid, with one recurrence.

G. B—— had evening temperature of 105 degrees first week, delirium beginning on 4th day, on 21st had subsultus and picking of clothing, and insomnia continuing for a week, temperature ranging from 103 to 104 degrees at night. Convalescence after seventh week, but delirium continued two weeks longer.

Two cases had phlebitis of the leg.

Ten cases had intestinal hemorrhage.

Mrs. B—— was confined on the 4th day, temperature 104 degrees, the fever ran the usual course, recovery after 5th week.

Arthur K—— age 13, after a mild form of the fever, appeared convalescent when malaria made its appearance. Temperature 105 degrees; after second day same symptoms recurred with usual course of malaria, large dose of quinine prevented a return. His history showed he had malaria eight years before.

The most prolonged case was that of Henry S—— who had a temperature for 102 days. This case had very severe

hemorrhages on 49th day; was not moved from his bed for 116 days. After convalescence gained 23 pounds in twelve days.

I could give many more interesting cases if time would allow.

From July 28th to August 30th only two cases were reported, but during the month of September there have been twenty cases, thus making 150 cases in all since the beginning of the epidemic, all of these later cases, with two exceptions, have been among the poorer classes living in tenement houses, two of these have died of perforation, both having been in a state of collapse for 48 hours before death. Temperature 93 to 97 degrees, and pulse 125. Abdomen extremely distended. The accident in each case being sudden, when everything seemed progressing to a speedy convalescence. One fact is worthy of mention, in several cases there seemed to be secondary infection, appearing from four to six days after apparent convalescence, when there had been no change in diet or management of patient, they usually had a temperature for seven days when the convalescence occurred.

Throughout the whole time the fever prevailed, all possible precaution was taken to disinfect discharges and the clothing of persons affected, the discharges were buried after disinfection with either corrosive sublimate or copper, and clothing put into boiling water. We all know how difficult it is to impress upon every one the importance of these precautions, and doubtless, among some of the more ignorant, the instructions given were disregarded, thus causing the later outbreak of the disease among that class.

Windsor has for twelve years been remarkably free from the disease, not averaging more than five to seven cases a year.

I will here state that the prison was entirely exempt, the water supply being from a different source.

The village voted to discontinue the old supply, except for motor purposes, and now the water comes from springs which flow from the hillside directly into a covered reservoir, from which it is pumped into a stand pipe, also covered. The springs are distant from any dwellings and furnish no possible opportunity for pollution.

No water supply that is exposed to drainage from dwelling houses can be safe, for only the most untiring vigilance can prevent some accident which will involve its consumers in as sad an experience as Windsor; after using the water system for over fifty years.

I cannot close this paper without paying some tribute to the noble way in which our citizens responded to the needs arising from such a calamity. A mass meeting was held in one of the churches and a committee appointed to solicit money and clothing such as was needed for the sick, and to provide food for the needy ones. Many volunteered as watchers, and every day the village was canvassed to ascertain the needs of all, the sum of $700 was raised to provide nurses for those who could not provide themselves. Twenty-eight nurses were employed, coming from Burlington, New York, Hartford, Ct., Worcester, and Boston, Mass., thus aiding the physicians in no small degree. No disease needs more careful watching than typhoid fever, and many owe their lives to the never-tiring care of the faithful nurse. Windsor may well be proud of her people as this test has proved them. May the time be far distant when any other town shall be called upon to prove herself her equal.

THE MODERN TREATMENT OF TYPHOID FEVER.

BY FREDERIC C. SHATTUCK, A. B., M. D., BOSTON.

The subject on which I have the honor of addressing you to-day is one of great and living interest, appealing to almost every physician in active practice. I, therefore, cheerfully accept the selection which was made for me, although I cannot flatter myself that I have anything especially new to offer you.

There is, perhaps, no other of the common acute infectious diseases which has such wide limits of variation as typhoid fever, and at the same time may present so many complications. A due regard for your patience, therefore, seems to make it desirable to dwell upon a few of the more important factors of the treatment of the disease, rather than to attempt to cover the whole ground.

The points, then, to which I shall practically confine my remarks are: *first*, diet; *second*, intestinal antisepsis and the management of the bowels; *third*, treatment of the pyrexia, as for convenience it may be termed, though, as will be seen later, the term is in no way descriptive.

Before we consider these points in turn let us generalize a little. It is a cardinal maxim in treatment, as applicable to

typhoid fever as other diseases, that above all things we should do no harm. Again, we must never forget that typhoid involves two things which may make more or less contradictory therapeutic demands. There is, in the first place, the duration and general character of the disease which brings in its train the almost certainty of tedious convalescence, the danger of death from exhaustion. In the second place there is the constant local lesion, the intestinal ulceration, the extent and depth of which we have no means of estimating or even of inferring. We know, however, that several weeks may be needed for cicatrization after the fever has subsided. The great dangers from the intestinal lesion are, of course, peritonitis and hemorrhage. Peritonitis from rupture of a mesenteric gland is rare and practically beyond our power to influence in any way. The great importance of early diagnosis must also be mentioned on account of its bearing on treatment. Undoubtedly one of the causes for the high mortality, especially in urban hospitals, is the late period at which many cases are received. The disease itself, with its gradual and insidious onset and long course is exhausting enough to the nervous system without a needlessly prolonged struggle to continue ordinary avocations, and therefore, if there is even suspicion of the existence of typhoid fever, the patient should be put at absolute rest until such suspicion is removed.

Diet. This is the division of our subject in regard to which conflict especially arises between the treatment of the patient and that of his intestine. The better his nutrition can be maintained, other things being equal, the more rapid will be his convalescence, the less the danger from exhaustion. But he has ulcers in his intestine which may perforate the wall

of the gut or of blood vessels contained in it. A question which I have been asking myself of late years, and on which I am trying to get light, is whether most of us have not allowed our dietetic treatment to be too much dominated by the local lesions. "Omne ignotum pro magnifico." The pulse, the respiration, the temperature, the abdominal distention, the tenderness, the state of the tongue, the ratio between the resistance of the patient and the demands upon it; all these are more or less open to direct observation or even measurement. Not so the constant intestinal lesion. We know that it is constant, and that in a certain proportion of cases fatal hemorrhage or perforation occurs; but we have absolutely no means of determining whether a particular case is likely to escape or fall victim to one of these dangers. Peristalsis cannot be arrested for weeks in order to carry out the broad principles of rest for an actively inflamed part. Again, are we quite emancipated from the old doctrine of the lowering treatment of inflammation? We do not bleed, purge, and puke our fever patients now-a-days; we do not withdraw water; we do not restrict food as our fathers did. But it is certainly fair to state that the profession, as a whole, considers pyrexia in itself an indication for lowered diet, liquid, often exclusively milk. Is it not possible that we sometimes make a mistake in dieting our patients with reference to their fever, rather than with reference to their digestive power? It is true that self-limitation is not nearly so constant a feature of tuberculosis as it is of typhoid; but we adjust the food of our tubercular patients to their digestive limits, even if we believe them to have intestinal ulceration. We see patients with typhoid whose tongues are clean or nearly clean, and whose digestive power seems to

be relatively or absolutely unimpaired. I have in mind several hospital patients who have gone safely through what I afterwards became convinced was typhoid under extra diet, which I should not, of course, have allowed had I not at the time of the pyrexia thought that typhoid could be excluded. I trust that I shall not be misunderstood. I am neither an advocate nor silent practitioner of indiscriminate diet in typhoid fever. I do not give my patients fish-balls or beans, even Sunday mornings, nor pie at any time, although I esteem myself fortunate in that I live in the pie-bean-fish-ball belt. The local lesions preclude such things even if the pyrexia does not. But I cannot see why patients with typhoid fever should not have anything which is easy of digestion and leaves such residue as may reasonably be expected not to excite undue peristalsis and irritation of their ulcerated Peyer's patches. Reference is to be had to the particular case. Those cases of typhoid fever in which irritability of the stomach is so pronounced that that very unfortunate term, "gastric fever," may be applied to them, are to be managed in one way; those patients who are clamorous for food in another. Milk, precious as it is in most respects, has the disadvantage of leaving a relatively enormous intestinal residue; and yet is not the intestinal lesion one cause of its great popularity and often exclusive use. I now give my typhoid patients who seem able to bear them, eggs, raw and very soft boiled, custard, animal broths, strained gruels, ice-cream, junket, blanc mange, even scraped or very finely minced meat in addition to their milk. During the two years I have followed this plan, I have seen no reason to regret it. I hope that it may have tended to obviate the risk of asthenia, and to have shortened the period of

convalescence in a measure. The stools, of course, should be watched to see whether they contain undigested food.

We should remember that there was a time when we attributed relapse to dietary errors. We have all seen the recrudescence of fever after unsuitable diet, just as we have seen it follow fatigue, emotional excitement, or undue fæcal retention. But I do not believe a true relapse has ever been caused by food, however unsuitable. In short I plead for individualization in the dietic management of typhoid fever as well as anywhere else in medicine, and the administration of as much and as wide a range of food as the patient can digest, and as will not prove irritating to his ulcerated intestines. Water should be given freely internally to promote the elimination of soluble poisons.

Intestinal antisepsis and management of the bowels. Sepsis and antisepsis are now-a-days words to conjure with. We have learned much of late years about the role played by organisms and their products in the causation of anatomical change and of preversion of function. We are so impressed by the results which in surgical affections particularly have followed this increase of knowledge, that as it seems to me, we may be in danger of allowing zeal to out-run common sense. The pathogenic germ of typhoid fever seems to have been identified. We know its habitat in the body, something of its mode of entrance, and much of what it does, and it naturally occurs to us to try to destroy it in situ, or at all events to neutralize its action; hence the use of intestinal antiseptics, so called agents which are so insoluble that they can reach the intestine and there tend to check putrefactive or fermentative changes.

It seems to me there can be no question that we are able to favorably modify faulty intestinal chemistry by means of these agents in many cases of intestinal indigestion; but there are certain facts of which we must not lose sight. In the first place, decomposition is physiological in the intestine Secondly, its existence depends probably on the presence of organisms, destruction of which, were it in our power, would be a serious detriment to any person, sick or well. Thirdly, whatever the future may have in store for us, we have at present no means of directly interfering with the activity of the Koch-Eberth bacillus without interfering with the activity of the physiological intestinal microbes. Fourthly, the Koch-Eberth bacillus does not limit its residence in typhoid fever to portions of the intestine which can even theoretically be acted on locally. Again, obviously disordered intestinal action is by no means so invariable as the books would have us believe in typhoid fever, unless my experience is very exceptional. Analysis of 233 cases of typhoid fever which have been under my personal care in hospital during the last eight years shows the state of the bowels to have been as follows: diarrhœa a prominent symptom in 18½ per cent; diarrhœa a transitory symptom in 18½ per cent; regular bowels in 14 per cent; constipation usually relieved by enema in 49 per cent. Still further, there is no evidence to show that the disease can be aborted by early purgatives—calomel, for instance—followed by more or less continued intestinal antiseptic treatment; nor have we any reason to believe that relapse is less frequent in cases systematically thus treated. It seems to me to follow inevitably from the above that there is no justification for the routine employment of this class of drugs in typhoid fever, inasmuch as evi-

dence is lacking that they can exert any influence here, other than that which they may exert in any other disease characterized or accompanied by intestinal lesions or disordered functions. Their use in my belief should, therefore, be limited to cases in which diarrhœa, very offensive movements, meteorism, or other special indications are present. Thymol, thirty grains or so a day, is highly recommended by F. P. Henry; napthalene, I cannot commend, it produced stranguary twice, and hematuria once out of seven cases in which I used it, though the doses were larger than would be given today. My friend, Dr. Geo. L. Peabody, of New York, used it largely at one time, but has now entirely abandoned it, and writes me that the cold bath is his only routine treatment. I prefer, myself, small doses of the salicylate or subgallate of bismuth. The former may be combined with beta-napthol. Of course the astringent properties of the bismuth compounds are to be remembered. I cannot see any objection to, and often order, a preliminary dose of calomel, especially in cases which come under observation early and without pronounced diarrhœa. In cases characterized by constipation I resort to water enemata every second day. Glycerine enemata cause so much peristalsis in some people that they are not advisable in typhoid fever. It is my habit in cases of intestinal hemorrhage to administer morphia to the point of mild narcotism, with the idea of arresting peristalsis as far as may be, and thus, perhaps, limiting the amount and duration of the bleeding. Lapartomy does not hold out much hope of rescuing the patient suffering from general peritonitis following perforation. A local peritonitis may get well spontaneously, or any abscess which it may cause can be opened later.

We now come to the most difficult part of our subject, at least so it seems to me. I mean the so called antipyretic management of the disease. The term is really not applicable, for there can be no question that the fever in itself is not so dangerous as we formerly believed. Cardiac exhaustion is not the result of pyrexia so much as of the absorption of toxines, and in mere reduction of temperature we are not necessarily serving our patient. Even the increased comfort which such reduction may produce can be too dearly bought. I cannot but regard the internal antipyretics thus far in common use as dangerous drugs in typhoid fever. One and all they are cardiac depressants in greater or less degree. Another objection to their use, less vital, though still real, is that they obscure diagnosis. I have repeatedly seen cases in consultation where these agents seriously increased the difficulties in deciding whether a patient had typhoid fever, or if he had typhoid fever, in determining the period of the disease or the presence of relapse. Now and then I see a case in which the discomforts of the pyrexia or headache are such that an occasional dose of an antipyretic seems to me to be justified; but these cases are quite rare. Phenacetine, I believe to be the safest of these thus far in common use. My colleague at the Massachusetts Hospital, E. G. Cutler, has been using this summer lactophenine in fifteen grain doses every four hours and expresses himself as so far pleased with its effects. It differs from phenacetine in that lactic takes the place of acetic acid, and it is said to be less depressing. Personally I do not believe in the principle and prefer to await further knowledge.

The cold bath treatment was supposed by Brand and his followers to owe its efficacy to the reduction of temperature

which accompanies its use, but the evidence is so strong that it is not the pyrexia that kills that they have abandoned their first position and attribute the results to the stimulation of the nerve centers, depressed and poisoned by alkaloidal substances. It does not seem to me fair to adduce this change of base, as has been done, as an argument against the employment of the treatment. A fact may stand fast although an explanation of it may be demonstrated to have been false. This method of treatment has been slow of adoption in this country as in England, but I think there can be no doubt that it is now making real headway. Many reasons for our conservatism in this matter may be mentioned; incredulity at first, the published statistics seemed too good; also reluctance to believe that any procedure so obnoxious to the patient could be useful to him; and, further, practical difficulties in the way, the large amount of attendance, and consequently increased expense involved, and the short terms of service enjoyed by most American hospital physicians. One of the staff might be willing or anxious to adopt the treatment; but it implies almost a revolution in the medical wards during six or more months in the year, and Anglo-Saxons do not like frequent revolutions, even in hospital wards, as well as do the Central American republics. As the German experience became more extended and the claims of Brand were largely substantiated in all parts of the Empire, when the Frenchmen of Lyons, and Hare of the Brisbane Hospital, Australia, proclaimed their conversion, J. C. Wilson and others determined to try the method accurately and conscientiously; for it must be confessed that Brand would hardly have recognized his offspring in the earlier attempts in his treatment in this country. The facts are readily accessible

in *Baruch's "Uses of Water in Modern Medicine," and †Sihler's little book on the Hydriatic Treatment of Typhoid Fever. The latter is especially interesting in that Sihler's personal experience has been mainly in private practice. ‡Osler tells us that his mortality in one hundred and seventy-four bathed cases in Johns Hopkins is 7.1 per cent. and that he believes this treatment, "harsh and onerous," though it be, saves three to four per cent. Since the introduction of trained nursing a marked change has certainly come over the aspect of our typhoid fever patients. The average typhoidal symptoms are not to-day in my wards what they were when I was interne twenty odd years ago, nor is the mortality nearly as high. I believe that the cold spongings count for much in this gain, but I cannot see any reason why we should not get as good results in our general hospitals as the Germans and French do in theirs. In military hospitals and in private practice the mortality should be lower than in a general urban hospital, which receives patients late in the disease, often with constitutions undermined by drink and privation. But our results are not as good, and the only explanation I can see is our failure to adopt and fully and intelligently carry out Brand's principles. Of 233 cases treated by me expectantly and with cold spongings, 23 died, a mortality of nearly 10 per cent. In the summer of '93, Dr. E. G. Cutler had a bath tub put in the male ward and I continued its use when I succeeded him and am using it now, but in this period my number of bathed cases is too small to enable me to draw any conclusions. Nearly all the patients object to it, some bitterly, but this is far out-

*Physicians Leisure B'k Series, second edition 1893, Vol. II.
†Cleveland 1891.
‡Johns Hopkins Hospital Reports, Vol. IV. No. 1.

weighed by statistics from which there seems to be no escape. With the cold bath in private practice I have no personal experience, mainly because I have not had a case of typhoid fever in my own practice for several years, though I have seen many cases in consultation, but it is my belief that we shall find the objections to its use less formidable than we are now inclined to think them. Sihler's experience speaks in favor of this view. For some years now the cold spongings have been made much more efficient in the Massachusetts Hospital by rolling up the rubber sheet placed immediately under the patient at the sides so as to form a trough. We sometimes use water at 60 degrees, sometimes water with a little ice in it to make up for the heat absorbed from the body. One attendant can use cold water in this way while two are almost indispensable for the tub bath with affusion to the head and friction to the body. The cold wet pack can also be given by one attendant. Baruch cites Liebermeister's assertion that five wet packs of ten minutes each are required to abstract as much heat as one full bath for fifteen minutes. Within the last fortnight these three methods of using cold water have been tried by the kind permission of my colleague, Dr. Cutler, successively on several patients in the ward in order to contrast the results. These show no marked or constant difference in the antipyretic value of cold sponging at 60 degrees for twenty minutes, the cold pack at 60 degrees for fifteen, or the full bath at 70 degrees for ten to fifteen minutes. A temperature of 102½ is considered as an indication for cold water. After all is said the argument for the strict Brand method is that a mass of statistics from different observers in different parts of the world show better results under its use than those who do not use it

can bring forward. *A. L. Mason reports that of 676 cases entered on the books of the Boston City Hospital as typhoid fever in 1890 and 1891, treated with spongings and expectantly, the mortality was 10.4 per cent. and he wisely cautions us against drawing conclusions from small numbers of cases. My statistics afford a good illustration of the need of this caution. In the years '86 to '88 inclusive 129 cases of typhoid came under my care in the hospital with a mortality of 8.5 per cent. My service was then changed from the summer to the winter term, and in the next five years 104 cases came under my care. In these the mortality was nearly 11.5 per cent. practically 3 per cent. higher, and yet cold sponging was much more efficiently practiced in the latter than in the former series. A few cases brought moribund to the hospital, or an accidental series of the graver accidents of the disease makes a great difference in small totals.

The use of alcoholic stimulants calls for the exercise of more or less judgment. In a considerable proportion of cases they are never required unless the tub bath is used, reaction from the temporary depression so often following this method of the application of cold water being hastened by small quantities of spirits and water.

In conclusion it only remains for me to express the great pleasure which I have in meeting the Fellows of your society, and to thank you for your courteous attention.

DISCUSSION.

DR. A. P. GRINNELL: *Mr. President, and Gentlemen of the Vermont State Medical Society*: I am exceedingly sorry that Dr. Richmond is not here to follow out the program

*Boston Medical and Surgical Journal, Vol. 126, page 329.

as stated, as I am sure the Doctor's experience in the last twenty-five years has been much larger than mine in typhoid fever; but I am very willing to say a word and express our thanks to Dr. Shattuck for his admirable paper. I feel personally under obligations to him for bringing forward several things which have troubled me exceedingly in my own practice.

I have been guilty of pursuing the practice of medicine for something like twenty-five years and during that time I can well recall any number of cases of typhoid fever, in fact, the first patient I ever had was a typhoid fever patient, and I can remember the keen interest I took and the study I put upon the case and the instruction I gleaned from text-books. The first cases I had I treated heroically, and in spite of my treatment they lived, and it is only within a few years indeed that I have had the courage to use the treatment that has been adopted and is now, in many of the text-books and to draw from it in my directions to others. I have learned, without text-books, by constant contact with people suffering with fever that medication was of the least importance. I have not learned it from any particular physicians. All the physicians I have met have been giving medicine according to text-books and carefully guarding the patient's diet, and I am under special obligations to Dr. Shattuck for speaking as he does in his excellent paper. I have often believed we were starving our patients by obliging them to take only milk, believing that milk was the only diet the patient could take, but I have satisfied myself that it was wrong and I am satisfied that we can afford to feed those patients with proper precaution and that nourishing is one of the proper things to do from the beginning to the end of the

disease. I have no restricted diet now and I have several cases under my treatment and I think they will all recover, and they are practically receiving no medical treatment at all—practically nothing—and when I do give something it is because some symptom wakes me up. If I find the temperature rising to 103 or 104 it strikes me that if it is allowed to remain for any length of time some organ might give way and therefore I wake to realize that something must be done to lower that temperature. I very nearly if not quite killed several people. I affected the heart in many cases and had to sit by and fan the breath of life into them throughout the night. I am sure that I had this effect. I am now satisfied that it was not fever that distressed those patients in particular, and am also satisfied that even to lower the temperature by some artificial means only does more harm than good—it comes back again like a pendulum and back to a higher point than before.

I would like to ask Dr. Shattuck if he is satisfied that the cases that have been reported to us to-day were typhoid fever; if he is satisfied by the symptoms of the one hundred and fifty cases of which forty-nine per cent. were troubled with constipation, that the disease was typhoid fever? I should want to ferret out the symptoms in every way and direction. I do not think that every case must have diarrhœa, but my experience is that seventy-five per cent. have diarrhœa. I do not suppose it is necessary that you should always have muttering delirium; I do not think it is necessary that we have hemorrhages; I do not believe that it is necessary to have the rose colored spots.

I now recall a case of typhoid fever to my mind that I struggled along with, where for fifty-one days the patient never

had a temperature below one hundred and the temperature would go to one hundred and six every single day of the fifty-one days unless we used the cold water pack. Every day it was tried, over and over again, and during that entire time while cold packing was done the temperature would drop at once to one hundred and two and then we stopped the use of the cold water. When it rose above that we immediately proceeded with the cold application and that patient during that time of constant fever did not have a diarrhœa but she had every other symptom with the exception of delirium.

Of course the subject of typhoid fever to us is a very common and dry one to a certain extent, because it is a disease we treat so long; we spend weeks in the care of a person suffering with typhoid fever. I do not fully agree with Dr. Shattuck in regard to the use of stimulants. I have received benefit by giving small doses after the third week. I have felt it necessary to do it, and I think I have strengthened the patient by a small quantity of stimulant.

During the constipated condition of the bowels I have no hesitation in giving small doses of calomel until I get a movement of the bowels. I have found that the use of glycerine produces more or less contraction and pain, and should be avoided.

There is not a person here of my age or even younger but what has seen more typhoid fever than I have and who will not second everything that has been said by Dr. Shattuck. To me it is an interesting subject and I am under obligations to Dr. Shattuck for his address.

Dr. M. R. Crain: I have been very much interested in Dr. Shattuck's very excellent paper, and in Dr. Grinnell's re-

marks in regard to the diet in typhoid fever. I have always fed my patients well, although I have largely restricted them to a liquid diet. I have always tried—since I commenced the practice of medicine—to give them all the liquid diet that they could possibly digest, and in some cases have allowed them some solid food although in most cases I have restricted them to a liquid diet. I have given milk freely, broths of all kinds, and eggs, in some cases a whole egg, and in others only the white of an egg, according to their power of digesting it, and liquid extract of beef, and I have never had a case die of exhaustion. And as far as medication is concerned I have treated cases throughout my practice without any medication, and although we can do that in most cases successfully, yet I think we can do much by the action of drugs in antiseptic medication. Back in 1880 I commenced using antiseptics. At that time the use of carbolic acid and iodine were common and of course they were largely absorbed in the circulation of the stomach, and although statistics seemed to show a great improvement they have long been abandoned. I have tried naphthaline and some other remedies but the only drug as an antiseptic that I have ever received any benefit from that I could detect myself was Thymol. I commenced using it two years ago and have used it ever since. I have now three cases in which I am using it. With two of them I commenced it early and after they had been sick ten days stopped it for a few days when I went back to using it and the temperature became lower, the mind became clearer and the patient was much better. I always give it in the form of a capsule—I do not suppose it has any effect on the bacteria, but I do think it is an antidote to a certain extent, or so much is not absorbed into the general cir-

culation. If we commence early to use it I think we can modify the disease, the average temperature will be lower and there will be less delirium.

In regard to the treatment of constipation. In my experience I have always used calomel enough to open the bowels. I think it produces less irritation of the bowels than any other laxative we can use and I think it is important too—although I do not wish to carry it to an active cathartic effect—I think it is important to keep the bowels moved once or twice or even three or four times a day, if the movements are not watery. The mind is clearer and I have never seen any bad results. I commenced to use it when I commenced the practice of medicine and see no occasion to abandon it.

In regard to antipyretics. I commenced to use these, although not the tub bath, but the sponging and wet packs, and I have used these steadily in my practice. Internal antipyretics I have had no use for, for a number of years. The most satisfactory results ever received were from sulphate of soda, but I have not used it for nine or ten years. I recollect I had six cases in one family, all with high temperatures, where I used this remedy, and I never saw any depressing effect on the heart. I used to dissolve what I would give in a day in half a pint of water, and divide the doses about fifteen minutes apart along in the forenoon, and in that way prevent the evening rise of temperature, but I do not think these antipyretic medications should be continued. I know that sometimes I used them where there is a great deal of pain in the head, to quiet that if the cold application to the head and the sponging did not relieve it. In a few cases I have used them, but I depend mainly on the cold sponging according to the

rate the temperature rises. I always intend to have the patient drink a quantity of water. Of course the cold sponging and the large doses of water internally is not new in typhoid or other fevers, although they put it now on a more systematic basis.

In regard to the tub bath. I think when you practice cold bathing so that you weaken the heart and make the patient look blue, you are doing harm unless you have a very high temperature.

In regard to the use of stimulants at the time of the bath, in my experience it is better practice to give the stimulants just before the bath, because then you stimulate the heart and get more reduction in temperature and better effect than you do in giving a stimulant afterwards. In all cases where the capillary circulation is not good, with a high temperature, I have them give the stimulants just before the bath, and I think with advantage.

DR. C. W. PECK: I do not rise with the intention of prolonging the discussion upon this paper but I feel that I would like to express my thanks to Dr. Shattuck for his very valuable paper, and especially because it suggests to me some things upon which I have reflected.

When I heard the paper on surgery I thought I was a good deal behind the times because I understood the gentleman to say—that is, I drew the inference from his paper, but I may be wrong however because I had just come in and did not fairly get the drift of things—that lacerated cervices were to be sutured at once in cases of rupture in confinement.

I find myself greatly behind the times as to the treatment of typhoid fever notwithstanding I have had a considerable ex-

perience. This question of diet I wish to speak about. Nothing would gratify me so much as to know that I can feed my patient. I have treated typhoid fever for twenty-eight years and I have been obliged, according to my idea, to keep them on milk. They have found fault with it so I give them gruel and porridge and beat about the bush keeping constantly in mind my milk diet. Now with all due respect to Dr. Shattuck's able paper, I have never been able to feed my patient anything else but milk without producing a disturbance of the bowels—never. I have put them on bread and milk and every time I have been obliged to abandon it. I am going home now—I have four cases of typhoid fever, and I am going to stop at the market, they are going to get something to eat; I am going to try this new regime.

Now with regard to the temperature. I have just treated two cases, they are now convalescing, in which the temperature ran up to 105½ and I did not use any of these modern antipyretics. I tell you that the first case upon which I used one of these remedies it took me all night and another man with me to keep the patient alive. We fanned her, we put brandy under the skin and used every possible means we could to keep the breath of life in her, and we got her out of it, but I haven't used any antipyretics since. They may be good articles, but once is enough for me—that settled me.

With regard to the treatment of typhoid fever. I do not know how the patients are in the other parts of the State, but with me if you do not give them something they will give you something. If you go to see a man, or a woman, or a child, if sick, they have got to have medicine of some kind and consequently I have been puzzled to know what to give, for I

had to give them something, and I did not want to do harm. One remedy I have given is the 20th of a grain of calomel, and found I have had good success with it. I do not know as I have affected the case. When you put a dose of medicine into a man's or a woman's stomach that has got typhoid fever, it is an enigma. I have given these remedies from the fact that I believe that the mercurials are a liver stimulant, and I believe that the larger amount of bile going down through the tract is one of the best antiseptics in the bowels you can find. If you will take twenty-five feet of intestines and tell me of something that will disinfect that tract and keep it in as good condition as the bile from the liver will do it, I shall be under obligations to you.

Now you know that everybody in the treatment of disease especially Doctors, get conceited. We think we have got the pet remedy to do the work. Now when my patients get constipated I give them mercurials, and for some unknown reason—it may be through the instrumentality of divine Providence—my patient's temperature comes down. I have a remedy in mercurial with arsenic which I give that starts the bile, gives lower temperature, your patient looks better—is better, and I think I have done a pretty smart thing. It may not have been the remedy; it may have been time for the patient to get better, but that is the reason that I give it.

DR. F. C. SHATTUCK: In reply to Dr. Grinnell's remarks upon the diarrhœa: In the first place he asked in regard to the diagnosis. I think there can be no question but that the diagnosis was correct in these cases—as correct as it is apt to be in medicine. The cases were carefully watched and not only carefully watched by me but by the house physicians. I

think there is no question but that the diagnosis was correct. There were two hundred and fifty-three cases I have had myself, and the statistics are correct. I frequently called the attention of the stewards to the importance of close attention. I think that we have got to remember that the intestinal ulceration has nothing to do with diarrhœa; that the diarrhœa of typhoid fever stands in no relation to that at all. I think the diarrhœa is entirely in relation to a general condition of the mucous membrane.

I thought of giving my statistics on the matter of stimulants, but did not want to cumber the paper, but I should think it was some twenty-five or thirty of my cases that had no stimulant at any time.

In regard to Dr. Peck's remark, I hope he won't stop at the grocer's also on his way home, he said he was going to stop at the butcher's and get pork and beans. It is my practice to give all soft solids that are entirely unirritating. I have treated a great many cases on an exclusive milk diet, but I do not do it now. I think we can afford to be a little more generous in many of the cases.

Dr. O. W. Sherwin: In regard to Dr. Brewster's paper about the water supply. Now Windsor, doubtless, supposed its water supply was pure. I will say a word as to the investigation and the care necessary to keep the water supply of the towns up to the standard and how modern improvements sometimes will effect such things.

Woodstock has prided herself on the purity of her water. We have a reservoir and two streams, one coming through a valley in which there are no houses or inhabitants. It must be absolutely pure as mountain springs can be, and the sup-

ply from that source is not equal to the demand and there is an addition from the valley beyond in which there are a number of houses. That was all looked over two years ago and everything found as safe as it was supposed could be. The past spring the health officer asked me to go with him on a trip and we went there.

We found three places where farmers had been doing a little improvement of their own in the way of drainage, and this contaminated our water supply. We insist that constant supervision is necessary in order to warrant the purity of water supplys.

DR. H. R. WILDER: In the matter of typhoid fever and of water pollution by its germs, discussed in Dr. Brewster's excellent paper, I am greatly interested.

We have heard of the treatment of the disease after it was acquired, but we should be greater benefactors to humanity were we able to prevent it. I believe we are able to do that in many cases, or would be able so to do were we in the habit of looking after the causes sufficiently.

To emphasize the point made by Dr. Brewster on the contamination of water supplies by typhoid germs, as was the case in the Windsor epidemic, I will relate our experience in Swanton, although on a smaller scale.

Into the Missisquoi river, is a small brook emptying about two hundred and fifty yards above the intake of our water system, and into this brook some two hundred and fifty or three hundred rods above empties a water closet. It seemed to some an insignificant affair for a health officer to pay much attention to, but by others acting with me I succeeded in getting the corporation to instruct the present board of officials to cause

its removal. It had existed for about three years without any apparent ill-effect upon the health of those who used the water, but about the time the authorities voted to have it removed, it transpired that in this family using this water closet was a case of obscure disease—the physician did not name it. In fact it never was reported to the health officer officially, but was afterwards mentioned as a case of typhoid fever which it proved itself to be in time to the attending physician. Well, the result of this was that there occurred among those supplied with this water a large number of cases of fever, and most of them were marked with the characteristics of typhoid fever. Some of them were a sort of mongrel fever that was hard to identify; they were not really typical cases of typhoid fever, but all passed as such, and these occurred within a short time after this case in the family using this brook for a sewer, showing quite conclusively the cause to be infected water. I mention this experience to show the importance of a careful supervision of the water supply and the extreme virulence of the attenuated poison resulting as it did within about twenty-five days in this epidemic of fever, which was confined wholly to those who took water from this water system.

THE MANAGEMENT OF PREGNANCY.

BY D. L. BURNETT, M. D., SOUTH ROYALTON.

Though the pregnant process is often called a physiological one, it approaches so closely to a pathological state as to many times call forth all the resources of the most intelligent practitioner of medicine, and in no branch of our art will our efforts be more appreciated than in endeavoring to decrease the discomforts of the period of gestation.

Many women find themselves unusually well during this period, but it is of their more unfortunate sisters that we now speak. Above everything else comes the necessity of favorable hygienic surroundings, both in regard to personal cleanliness and pleasant environments. Plenty of nutritious food should be eaten, and especially to be avoided are highly seasoned articles and alcoholic stimulants. The dress should be comfortably warm, and all constrictions like corsets, garters, and heavy tight waist bands should not be used, though in many women with large, flabby abdomen, an abdominal supporter is a means of great comfort. Excessive or overwork is to be avoided, but some pleasant healthful employment is to be recommended, both as a means of exercise, and also to prevent the mind's dwelling on the approaching ordeal of labor. Aside from the physical conditions we should endeavor to surround

our patients with cheerful, congenial companions, with freedom from mental or moral worry, but at the same time the opposite extreme of morbid sympathy from over officious friends or relatives should be studiously avoided.

In regard to the general or special conditions we will speak first of anæmia. During the early months, it is well to institute a prophylactic treatment. Good milk, plenty of eggs, etc. are the main stays. Food should be taken in small quantities and often, if there is anorexia. Iron, arsenic and strychnia with the vegetable bitters are indicated.

The pernicious form is rare, and occurs principally in women who have borne children in rapid succession.

In my experience, one of the most trying complications of the pregnant state is the occurrence of uncontrollable vomiting. We have all types of this trouble, from the slightest feeling of nausea in the early morning to the hyperemesis that takes the life of both mother and fœtus. The animal, mineral, and vegetable kingdoms have all been searched for a remedy, or even a palliative. Mechanical means and local applications have all been vaunted, and still we are without a trustworthy expedient for relief.

Laceration or erosion of the cervix, faulty position of the uterus, indulgence in sexual intercourse, gastric or intestinal catarrh, constipation, and in the latter months, distension, and many reflex causes, these all, nay, many others, come in as the causes, and our treatment must be as varied as is the etiology, and alas, even then are we many times doomed to disappointment. One of the first things to do is to relieve any constipation, using a sedlitz powder, either alone, or with bromide

of soda—fluid extract of cascara sagrada does excellent service also.

Sexual intercourse should be prohibited in all cases that do not yield readily to treatment. Rest in bed is important. One of our best authorities, Lusk, recommends of all medicinal agents, 10 grains of bismuth subnitrate with 5 or 10 grains oxalate of cerium, taken ten minutes before eating. Half a drachm of chloral hydrate combined with 40 or 50 grains of bromide of potash or soda in milk as a rectal injection, very often is satisfactory. Some recommend the chloral in a suppository or capsule. I have never used it in this manner, but should imagine it would have too much of an irritant effect on the rectal mucous membrane for the patient's comfort. Nux vomica in gastric catarrh does good service. Fowler's solution, chloral hydrate, the bromides, atropine, drop doses of iodine, carbolic acid, ingluvin, hydrocyanic acid, pepsin preparations, alcohol in its various forms, the inhalation of oxygen may succeed in individual cases.

Ice cold effervescing drinks are of use. Cocaine, either by the mouth or incorporated with vaseline as an ointment to the cervix has some friends. Instances are on record of hypnotic suggestion apparently causing a cure.

Try to nourish the patient. Hot or cold milk given with lime water frequently and in small quantities will sometimes be retained. Beef tea, beef peptonoids, whites of eggs beaten with brandy, gruels, etc. gives a variety of means of nourishment. If the food cannot be retained at all, it is well to use hypodermics of morphine, either alone or combined with atropine and followed in 30 minutes by the nourishment. The influence of the opiate will quiet the reflex activity of the

stomach and allow digestive and assimilative processes to take place. Complete rest of the stomach by partial or complete rectal feeding is a method to be utilized.

Malpositions of the uterus should be corrected. Copeman's method is well and favorably known.

Any lacerations or erosions of the cervix are to be treated secudem artem. After all the methods of treatment enumerated the vomiting may still continue. The woman is emaciated, pulse frequent and weak, tongue parched and brown, urine scanty and perhaps albuminous, sordes on lips and teeth, disorders of the special senses, delirium, horrible eructations of gas from the stomach, vomiting incessantly, or perhaps there is a cessasion of the emesis which is to be looked upon with suspicion, as it is many times the forerunner of death. Ere we reach this fatal stage, and while the woman is yet able to bear the ordeal, an abortion should be produced. This should not be done till after mature deliberation, and with the advice of other practitioners. Nature sometimes steps in and takes the responsibility off our shoulders, but an expectant line of treatment must not be continued too long, as many many fair lives have been lost by this same expectancy.

Constipation frequently, and diarrhœa occasionally, complicates pregnancy. The latter should be treated on the usual lines, with perhaps some anodyne to quiet any reflex nervous irritability of the intestines. Constipation intensifies many of the discomforts of this period. Fluid extract of cascara sagrada or cascara with malt does good work. Care should be taken not to use evacuants that act by an irritant effect on the intestinal mucous membrane, or that produce a congested condition of the pelvic organs for fear of a possible interruption

of the gestation. If the urine is scanty or albuminous the salines and diarphoretics are indicated.

Varicose veins and hæmorrhoids are often troublesome. For the enlarged veins the blood pressure may be lowered by position and by saline laxatives, in small quantities. Equalized pressure by means of elastic bandages should be used.

Hot stimulating baths are exceedingly grateful. Nearly every case of pregnancy has a variable amount of œdema unconnected with any kidney lesion, ascertainable either by the aid of the usual chemical urinary tests or by the microscope, it being caused by the pressure on the returning venous blood currents. The slightest form shows itself only by swelling of the ankles and feet and needs no treatment. If the œdema involves the legs and vulva, and something seems necessary to be done, tonics should be administered, one of the best of which is the mistura ferri et ammonii acetatis or Basham's mixture which from its tonic and diaphoretic properties is especially indicated. Hot applications are useful. Saline purges by increasing the hydræmic condition of the blood increases the trouble. If the swelling and tension is so intense that gangrene of the skin is feared, punctures may be made with antiseptic precautions.

Premature labor has followed, however in so many instances as to be regarded as rather more than a coincidence.

Caries of the teeth frequently make rapid progress during the pregnant state, and often severe toothache occurs without pathological change in the tooth which resists medicinal treatment. Good authorities advocate the use of phosphate of lime as a preventive. Dental operations are not generally considered advisable.

Ptyalism is one of the rarer complications and often terminates only with the completion of pregnancy. It may be of a purely hysterical nature. Astringent mouth washes with belladonna and ergot internally is good treatment.

Heart burn may be palliated by sodium salycylate, charcoal, magnesia, aromatic spirits of ammonia, etc. Lime water taken with milk is valuable.

Pruritis either local or general, with or without anatomical change in the skin, sometimes, according to Barton Cooke Hirst, is so annoying as to make one consider the advisability of inducing an abortion.

Perfect cleanliness, vaginal injections of boracic acid solutions, cloths saturated in a carbolic acid solution or a strong hot soda solution and applied externally are usually very grateful. If there is any lesion of the cervix or any irritating discharge it should be treated. Cocaine in solution affords, at least, temporary relief.

Neuralgic affections are common. Prominently in this list we find the trigeminus involved. Liniments of various kinds may palliate or even cure. Phenacetine, acetanilide, and the long list of coal-tar derivities, gelsemium, cimucifuga, hyoscyamus, belladonna, cannabis indica, and electricity may all be tried. If there are distinct inter or remissions and exacerbations of the pain, quinine may be used with good hope of success. Morphine should be a last resort. Many times the pain only ceases with the end of gestation.

Insomnia is usually one of the minor discomforts, but its long continuance places the woman in a condition of lowered vitality for undergoing the pains of labor. We should see that she is in a proper hygienic state and takes plenty of fresh

air exercise, also that she avoids any excitement or worry. The use of stimulating hot sponge baths followed by a brisk rubbing at bedtime is a useful and simple expedient. Some of the milder sleep producers, as valerian, camphor, cannabis indica, etc. may be used. Sulphonal is an excellent remedy. The galvanic current through the head is of great service many times.

Irritability of the bladder is common, and often is not severe enough to call for treatment. Try to find the cause of the trouble which may consist of increased acidity or alkalimity of the urine or from displacement or change in position of the uterus. Nerve sedatives and diuretics are indicated.

Psychical alterations in pregnancy are infrequent compared with the period of child bed and lactation. The predominating type is melancholia. The treatment is prophylactic and tonic. In a woman who is strongly neurotic, we should especially insist on cheerful surroundings and pleasant diversions, with a close scrutiny of the excretory and secretory functions of the economy. An anæmic state is the rule in these cases, therefore tonics are of use.

DISCUSSION.

Dr. H. R. Wilder: There is very little to add to the completeness of the paper upon this subject. It seems to have been very ably treated, and the whole subject has been very thoroughly canvassed.

It is my purpose to emphasize some of the points in relation to the care of a pregnant woman.

The first thing, of course, in a case of this kind, is to be sure that our patient is in a pregnant condition—not always a

very easy matter to decide—sometimes most difficult, but there are certain sensations that are usually present, and one I mention—not as having been brought to my attention by my teachers, but which seems to be a good guide in many instances—it is the disposition to make water frequently, early in the pregnant state. That is, in the majority of cases, this is so. Of course the suspension of the menses, the morning sickness, and other sensations we are familiar with, are present more or less.

Another reliable sign is the change in the breasts—the areaola—as described in our text-books. Then after it is decided that pregnancy exists, it becomes important to surround the patient with the best hygienic influences. I do not mean to imply by that, simply physical influences, I mean mental and moral as well, because I believe that at this period of the early existence of fœtal life, it is very susceptible to the influences exerted upon the mother. In order to secure a healthy offspring, healthy mentally and morally, healthful external environments of the mother are necessary; or at least, they are to a large extent a predominating influence toward securing those conditions. Cheerful surroundings and influences of the kind that tend to make life bearable to the mother, although in some instances they do not seem to require them, who having no bad feelings, are always cheerful. Then there are the many other unpleasant symptoms that the mother is subject to and it becomes the duty of the physician when a case comes under his care, to make advance in the matter by the way of suggestions as to her proper care. She may not realize the dangers that are in store for her, and it is the duty of the physician to suggest to her the importance of careful at-

tention to her health lest she be exposed to the several dangers that may beset her later on in the course of her pregnancy. She needs to be surrounded by influences that will prevent her from unnecessary exposure to contagious diseases, and especially to the irruptive diseases, the inflammatory diseases, and especially pneumonia. Even influenza may be bad enough to occasion abortion; or, if pneumonia occurs in a patient it is an extremely dangerous complication, and we must guard our patient against all of these diseases so far as it is possible.

We may have very many obscure symptoms that result from displacement of the womb. That displacement may be be borne by the mother without serious complaint is true, some thinking it physiological and necessary to suffer about so much, yet we may find upon investigation that there is a displacement, that if neglected may bring about abortion. I had a case recently where an abortion was brought on in about two months by displacement. I mention this as it may occur in cases, and the physician's attention never be called to it in time to remedy it, and in fact it may not be so easy to remedy if his attention is called to it.

Then too, it is well for the physician to know of the condition of the kidneys—whether they are acting in a proper manner or not—whether disease is indicated by the presence of albumen in the urine. Not that I mean to say that the presence of albumen is necessarily a serious matter, because we may have albumen present in the urine of a pregnant woman in many instances and no serious results follow. I think some author gives its frequency as one case in five, but where it is present in the early stages of pregnancy, and in

great amount we may then look for trouble before the case terminates; and it may manifest itself unexpectedly if the urine has not been examined. We may get such premonotory symptoms as vertigo, nausea, persistent headache, and an infiltration into the cellular tissue, symptoms that require attention without delay. I say, as I remarked this forenoon, in reference to eclampsia, I believe we may ward off a great many cases of eclampsia by proper treatment of the kidneys. As we all know, most of these cases occur in the primipara, when the abdominal walls are most unyielding, and in my opinion the condition of the kidneys preceding and accompanying eclampsia is largely due to the pressure on the large blood vessels. This fault may be remedied somewhat. It is well to make some simple softening applications, such as the annointing of the muscles of the bowels. The physician should be careful to suggest many of these apparently simple things to the mother in her first experience—annointing her bowels, and perhaps her occupying the knee chest position at times, thus bringing the strain upon the abdominal muscles and in this way tending to stretch them, and so relieve the pressure upon the kidneys temporarily if not permanently. But if these symptoms go on from bad to worse and the kidneys become congested then they may need special treatment.

In relation to the anæmic condition of the mother, I think it more often exists than the plethoric condition. The treatment by depletion, bleeding, etc. has been practiced by a good many from the mistaken belief that every pregnant woman suffering from headache, or defective hearing and obstructed sight, were in a plethoric condition. Such treatment does relieve them in many cases, but only the nervous system

in a general way for the time being; but we must not rely upon bleeding, only as a temporary expedient—it must be supplemented by other treatment. Perhaps the case may be one of real anæmia requiring quite the opposite course for permanent relief.

CARE OF PATIENTS DURING GESTATION AND CONFINEMENT.

BY H. L. NEWELL, M. D., PROCTOR.

Mr. President, and Members of the Vermont State Medical Society:

Pregnancy is one of the most important conditions occurring in the life of woman, as well as óne which requires and should receive a large share of attention on account of the results which must inevitably follow. It is not only interesting by reason of the peculiar conditions which arise in the mother, but it possesses a still deeper significance when we stop to consider the new relationship which has sprung up through the presence of a new factor, the child.

The mother is called upon for increased physiological exertion and if her organism is not competent to meet this call the consequences can be little less than disastrous to both herself and child. If haply the child survives, its delicate organism suffers to such an extent that the lack of proper care during a few months of intra-uterine life may require years after its birth to repair the mischief which has been caused. This, and the fact that the mother is so liable to serious gastric, nervous and circulatory, as well as mental and moral disturbances,

render the careful and frequent consideration of this subject of prime importance to the general practitioner.

If opportunity allows we can do very much by preventing the ills which so many times jeopardize the health and life of both mother and child, but unfortunately in a large per cent. of our cases the first time we are consulted is when we are hastily summoned and find our patient in the throes of labor, many times being physically unprepared for this severe ordeal. Much good would result from helpful advice given, if as soon as she suspects herself to have conceived, she would consult her physician. Yes, and I will go farther and say that it is a debt which parents owe to posterity to see to it that they are physically sound *before* pro-creating children.

Is it not a sublime thought that parents are endowed with the physical powers of starting into existence a life which shall possess their likeness, which shall be the habitation of the spirit of eternal possibilities in the limitless beyond, which life cannot be terminated except by its own volition?

When so much wise, prudent thought and care is increasingly given to the breeding of our domestic animals, is it out of place, is it an innovation that I should call the attention of this learned body, the custodians of the physical weal of the progenitors of the coming generation—I repeat, is it out of place that your attention should be called to this subject? Is it not time to call a halt? Is it not a duty which we owe to those who look to us for advice and enlightenment to proclaim the importance of sound minds in sound bodies in order to insure strong, vigorous and healthy children?

Nor is this all, for I am persuaded by experience and observation that very much can be done during gestation to mod-

ify the mental and moral tendencies of the child to be.

From the earliest conception, the mother should be surrounded by everything to make her life delightful (so far as possible). Both intellectual and physical work of an agreeable nature are indispensable to the attainment of the highest good to both mother and child.

One writer has said that nine months of prayer by the mother before the birth of her child was better than nine years of prayer afterward. If this be so, and who shall deny it, can we not as reasonably expect that the physical and mental tendencies may also be molded, fashioned and tempered in harmony with and partake of similar attributes and distinguishing characteristics possessed by the parents.

For the physical, mental and moral benefit of the mother, and child, total abstinence from sexual relations should be observed during the period of gestation and lactation. We all very well know it is a physiological fact that when conception occurs, nature, as it were, closes up house to devote all her time and energy to the new life that is being developed, and that violation of this natural law results in hysteria with all its attendant troup of ills.

Rightly mated, healthy persons who obey such of God's laws as are now known may rightly expect children of a higher grade and finer and more perfect nature than themselves. They who seek to have perfect children must imitate the example of the parents of the one perfect Child ("and Joseph knew her not until she brought forth her Son").

We are all familiar with the causes of morning sickness as generally set forth in our text-books. I have been led from clinical observation to believe that there are one or more of

three factors which go to make up the sum total, the result of which is nausea and vomiting, viz. constipation from loss of nerve energy, bilious indigestion which may depend upon and result from the constipation, and last but not least, sexual intercourse.

Kindly but emphatically we must insist upon abstinence from coitus, remove and guard against constipation and help the stomach for a few days with some form of pepsin, and a large percentage of our patients will have no more morning sickness. If this advice be thoroughly and constantly followed, we shall avoid or prevent many of the disarrangements which otherwise are so liable to occur.

Disturbance of circulation during gestation is very common and is due to the mechanical pressure of the gravid uterus on the iliac veins, resulting in œdema of the abdominal walls, vulva and lower extremities being intensified by chlorosis and hydrœmia and is frequently associated with venous ectosis.

These symptoms may also be caused or aggravated by a loss of cardiac nerve energy or by enfeebled or weak cardiac muscles. They will be aggravated also by either functional or organic inactivity of the kidneys and bowels, in which case we may get headache, pain in back of neck and back, dizziness, nervousness, wakefulness and disturbance of the special senses. In such cases we are to look out and look sharp for breakers ahead in the form of the much to be dreaded and fearful uremic convulsions.

Uremic convulsions and how to prevent them is the principal object for which I have written this paper. I will undertake to say that without organic or renal heart disease, other

things being equal, provided that physicians are given control of cases from the beginning of pregnancy, they are culpable if they allow their patients to have uremic convulsions. From my own experience of nearly ten years, and which embraces no mean number of cases, I believe this much to be dreaded calamity is pre-eminently preventable.

My first experience with child-bed convulsions was just about ten years ago while a student at college. A young primipara was taken with severe convulsions in the beginning of the first stage of labor. Her physician was sent for and another one nearer was also summoned, and as I lived next door I was asked to come in and help control her. This was my first introduction into the awful presence and reality of the mystery surrounding the lying-in chamber.

Well, gentlemen, you perhaps can appreciate how all the poetry relating to the occasion and appropriate to the time and circumstances did not come to mind. It vanished. I had grappled with and over come raving maniacs many times during service in an insane asylum. I had witnessed the delirium of fevers and many surgical operations, had encountered single-handed patients with delirium tremens and those suffering with epileptic seizures, and when a boy on my father's farm had met and conquered mad bulls; but this? Why my hair went the direction taken by the quills on the back of that irritable and unamiable rodent quadruped immortalized by Shakespere. My young and tender feelings received such an impression as I shall never forget.

With the use of chloroform and instruments the doctors soon delivered the patient of a live child, but the convulsions continued and it was only after repeated large doses of chloral

and bromides and hypodermics of morphine and later by venesection were the convulsions controlled. I remained with the patient the rest of the day and all night and saw that the instructions of the doctors were faithfully followed, the patient having no more convulsions.

I was profoundly impressed and filled with admiration for the wisdom and skill that saved the patient's life, and I thought if medical skill can save one after such terrific convulsions, how much better it would be if it could prevent them. And I resolved that I would endeavor to shield my patients from this misfortune, and I am thankful to say that I have had but one case in my own practice and this occurred about four days after delivery and was easily controlled, the patient having but one convulsion. This was complicated with acute nepheritis, she having had convulsions at previous confinement.

The urine of pregnant women should be often examined during the later months as a routine practice, and in such cases where we have reason to suspect kidney trouble we should keep a close watch for symptoms as shown by the presence of tube casts or albumen. A slight amount of albumen may be present during the later months and not cause any symptoms save perhaps slight œdema of feet, nor cause any trouble during or after labor and soon entirely disappear.

We should, however, be on our guard against possible eclampsia, and should prevent mental excitement, indigestion, constipation or exposure to cold. True, interstitial nephritis is almost always aggravated by pregnancy.

When albuminaria is present early in pregnancy or in large amounts or associated with many tube casts the prognosis is, of course, much graver and the symptoms often severe; an-

asarca may become general, the urine dark colored and scanty, nervous symptoms show themselves in headache, vertigo, and vomiting, with derangements of the special senses, the body exhales a heavy, urniferous odor, and if these symptoms be not speedily relieved eclampsia, stupor, coma, and death may follow.

In these severe cases we may have to produce premature delivery, which we may do with good hope of saving both mother and child if this is not too long delayed. After premature labor or delivery these symptoms may all disappear or may go on as chronic nephritis.

Right here, let me say, never inject glycerine to produce premature delivery. It has recently been found to be dangerous and has several times proved disastrous. For treatment of these cases I would recommend milk diet, or milk with other easily digested food, except in severe cases, I would interdict eggs and meat only; if anæmic, some form of iron. My favorite is Blaud's Iron. If plethoric, venesection to relieve immediate symptoms, with restricted diet. If there is cardiac insufficiency, thus strophan with digitalis, diuretics, diaphoretics, hydragogue cathartics like pulverized jalap compound. Cups followed by mustard and hot fomentations over kidneys.

In short, make all the emunctories of the body that sympathize with the kidneys, help to eliminate the waste products and we shall find that the aid we have given them will be gratefully received as evidenced by their renewed activity and functional integrity.

Should eclampsia supervene, either before, during or after either premature delivery or labor at term, we must prevent the patient from injuring herself and from lacerating her tongue

by inserting the handle of a brush or folded towel between her teeth, administer chloroform and a hypodermic of morphia one-fourth or even one-half grain, and when patient can swallow give chloral and bromides in full doses and a heaping teaspoonful of compound jalap powder. If in labor, terminate as quickly as possible without violence.

The chloral and chloroform will usually allow of easy dilatation of cervix; if not, we can use Barnes' dilators. We can do podalic version if it can be done easily; if necessary, use forceps; if labor is progressing rapidly, let it alone.

Much depends now upon the skill of the operator; after child is born remove placenta by careful expression at once. Here let me observe that it is my belief that this act should be accomplished in nearly all, even in normal cases, without delay. It is a very rare exception that ten minutes elapse after the birth of the child before I have the placenta all right and I have never been troubled with flooding or hour-glass contraction when present at the birth of child.

In multipera I usually give one dose of fluid extract of ergot immediately after delivery of after-birth as a safeguard. It is not often required in primipara, although I have never seen any harm from its judicious use and I always leave a few doses to be given in case of flooding.

But more important than this, we should instruct the attendants, if flooding occurs to grasp the womb and hold it firmly for a few minutes. After delivering the placenta and carefully securing all the decidua, we should hold the womb firmly, but gently, for a few minutes to secure perfect contraction. Then, as soon as the mother is rested a bit, and we have in readiness warm blankets, we should remove every

shred of wet or soiled clothing from patient and bed, replacing with clean, warm linen with an antiseptic pad to vulva and the careful application of the much abused abdominal bandage. I believe in the use of the abdominal bandage—not because it is always, or usually, urgently required, but because it affords a great degree of comfort to our patients, and I think it helps to prevent the dilatation of the womb with consequent hemorrhage.

After a severe instrumental or protracted case, I would use antiseptic intra-uterine irrigation.

I am well aware, gentlemen, that I bring to your attention but little that is new or novel, but it is good for us, sometimes, to have our minds stirred up by way of remembrance, even though our thought does not overleap the ancient landmarks and boundaries set by our fathers.

DISCUSSION.

Dr. C. W. Peck: *Mr. Chairman, and Gentlemen of the Society:* I feel very much like pronouncing a benediction and keeping still upon this subject. I approach it with fear and trembling in consequence of its immensity. Of course it is impossible for me to discuss a subject of this magnitude and I am not going to undertake it. There are, perhaps, one or two points I may call your attention to and let the gentlemen present finish the discussion.

In the first place I feel like expressing my thanks to the gentlemen who have read these very valuable papers. They are very practical and all straight, and all right, but I have been lead to believe in consequence of my reading and observation—and I still think so, that pregnancy is a physiological condi-

tion. I think there is such a thing as a physiological conception, gestation and confinement, and the whole business, gentlemen, is a physiological process.

Now that being the case, it devolves upon every attending physician to determine each case as a law unto itself. It is our duty as medical men if we are called in time to study our case. Now you can get just as many varied differences in these patients as you have got patients and more too; no two cases will be exactly alike.

I can hardly more than state my experience in regard to some of these things. If I find a good healthy, rugged woman in the family way and doing well—nothing special to attract my attention—I let her alone. If she goes on all right and has her baby when she ought to have it and everything seems to be favorable and natural I do not meddle with her. I let her go along in her physiological way and I find I come out all right in the end.

Now this, which has been read, is a subject of great importance and one which is liable in any case to bring about, in my judgment, the worst possible condition of things. For instance, we will take that disease known as *Puerperal Convulsions* or *Eclampsia*, and I can think of nothing or in fact I find nothing in my practice that begins to come up to it in point of terror—one of those convulsions which you sometimes see. The doctor has taken the ground here that these things can be avoided. I am very glad to know that one man thinks so; I know certainly there is another that does not. I hope we have got the practice of medicine to that point where we can prevent these things. I think if we could take our patients and guard and treat them physiologically, I think a large num-

ber of these cases we could prevent; but, here is a case for instance, which you have already found, or are likely to find to-morrow, in which you can find no defect whatever in the action of the kidneys or in the physiological condition of your patient, but all at once, as quick as lightning, your patient is in a convulsion. Now, what is the cause? You look your patient over carefully and find no cause for your *Eclampsia*; it is purely a nervous convulsion. Now until they get so they make women without nerves, we may expect convulsions now and then, but I think they may be largely avoided by proper measures. I think there are two ways, speaking upon this subject generally, two ways in which we can account for the trouble. I think you are quite as liable with a woman greatly reduced in strength, poorly nourished, anxious, expecting a hard and severe labor, when she comes up to that point, to have a convulsion. Another and more severe one, I think—by the way I wish to say, that this condition of the patient compared with a plethoric condition which you sometimes find, must be the key to guide you in your treatment. For instance, if you have an anæmic patient who has a puerperal convulsion you would not bleed her. I should hold her right down with bromide and choral. Now take the other class of patients which I think is the class we are to consider most. It is the class of women who when they get pregnant take it upon themselves to eat anything and everything there is between the heavens and earth; they eat excessively and fill their blood full of unoxidizable substances. Now here is the theory; see whether I am right or not. The liver is the great drive-wheel of digestion, it is the important organ in the process of digestion and in preparing the blood to eliminate urea, and to take

care of what is put into the system. Now of course, with a woman in the family way, her liver is called upon to do much more work than it would if she were not pregnant. Supposing she keeps on eating excessively, at the end of nine or ten months you have got an individual whose blood is filled full of injurious substances, and if you have a torpid liver and kidneys, constipated bowels, etc., the chances are—no, the chances are not; but still it is in that class of cases or patients that you require venesection; it is that class of patients I should have bled the first time instead of the last time, as the case cited in the paper.

I was so unfortunate as to have four cases of puerperal convulsions come right along one after the other, and I was so fortunate as to get them all out, but the stout ones I bled and I held them down by the use of hydrate of choral which I consider a valuable remedy in this class of cases. I speak of these two classes because I think that the treatment is decidedly different—one is right the opposite of the other.

Now in the majority of cases, I do not give ergot. If my patient is all right, I trust to nature. I have trusted her a great deal and she has never yet failed me. Ergot sometimes will close the uterus. Sometimes I have used it in five or ten drop doses, giving it every half hour until I could stimulate the uterus to come up and do its work. Otherwise, if the patient is doing pretty well, I let her alone.

Now, in regard to uterine irrigation, I see no reason why we should not practice it on the principles of surgery, but I have kind of felt my way up into it a little bit, and I let go. If my patient gets in that state where she has got a discharge that is offensive from the uterus, why, I roll up my sleeves

and go at it; I think it is neck or nothing, and I go to work and clean it out and irrigate it and put on some disinfectant solution; but unless I see these things called for, I let the patient alone. Not long ago I was called to attend a woman, and found that the nurse had irrigated the uterus and cleaned up things generally because she was accustomed to do so. I do not think it did any harm, and as I said it is possible that modern surgery will bring us to that point where we will irrigate the uterus after confinement; but where I have tried it, I have felt sure I was irritating the uterus, and my experience is that the quieter you can keep it and let that lochia flow out, the better it is for your patient.

Now I might say something in regard to diet, which I think is the most important feature in every case. I think the woman who is pregnant and anæmic should be well nourished with good, easily digestible food, and I think the woman who is disposed to eat to excess should be controlled, and perhaps that will cover the ground as well as anything I can say. I once read a paper upon the use of fruits and sugars and starches, and I touch the matter gingerly; but I do believe, gentlemen, that about one-half of the diseases which we are called upon to contend with, yes, I will say nine-tenths outside of the contagious germ diseases, are brought about by the way in which people live. There is what you put into your system and what you get out; there is an income and an outgo, and gentlemen, the man that balances these and keeps away from specific poisons, is going to be well according to my idea of things. If you overload the liver and stomach with starches, sugars, etc., you may be sure of one thing—that if you keep it up, it

is only a question of time when you are going to be in the hands of the doctor, and he has got to go to work and straighten you out.

I was called to see a case five days ago, a woman about forty years of age. Both legs were bloated to her knees; the heart was affected, and one-half of her was almost entirely useless; she had tremendous headaches, and all of this was in consequence of imperfect digestion. I obtained her water, and I found she was making about a pint a day with a specific gravity of only one thousand. In forty-eight hours she was making nearer a quart of water, the specific gravity of which was one thousand and twenty-six, and her head had cleared up, the œdema had begun to disappear and the patient was much better, and all that disturbance was brought about by retarding the portal circulation. The liver is a tremendous great sponge, and if it cannot perform its work, you are going to poison the whole system. The pregnant woman must keep her digestion in good shape and in good running condition. If she does not, and trouble begins to appear and she eats moderately and plainly for a few days, she thinks she is cured, yet she has not taken anything whatever to act on her liver and kidneys, that is, directly. If there is anything under heavens that will prevent *Eclampsia* or *Puerperal* fever, it is careful attention to these matters by the pregnant woman. (Applause.)

Excuse me Mr. President, I have two or three little questions I would like to read to these gentlemen, to show you how things are moving in this world. I picked up a book and I want to read you just two or three statements that the author makes. He says, *First.* "There is a fever which is peculiar to puerperal women and is therefore properly named puerperal

fever. Now the question right here arises, have we such a thing independently as puerperal fever?" I give you that as a poser. "Or is it a complication which arises in consequence of some local irritation? Here is the next point which he states. This is, *Second*. The symptoms of this disease are distinct, and are not a consequence of any local lesion, and it is as much a distinct disease as typhoid fever, typhus fever, or intermittent fever." *Third*. "It belongs to the class of diseases known as 'Zymotic Diseases' and results from some unknown blood change." Now, if that is a fact and it is brought about by some blood change, my theory would be that it was due to the unoxidized particles in the system. Now I ask you the question as medical men, is there such a thing as puerperal fever independent of all other things? We have lots of diseases that are associated with the puerperal state—now I am asking you this question here—is there such a thing as an independent puerperal fever—independent of any other cause? *Fourth*. "And we are as ignorant of the specific cause of these blood changes as we are of those which cause relapsing fever, scarlet fever, or any of the other essential fevers." There are three or four others, but I will not read them—they are very similar in nature.

(Question from the floor.) I would ask if in the opinion of the speaker, puerperal fever is not similar to surgical fever?

Dr. Peck. I suppose that is what Dr. Barber means when he speaks of it as an 'essential disease.' I think some cases of puerperal fever are just the same as surgical fever. I think you can have a puerperal fever following a severe laceration of the uterus. I think many times you can absorb the poison; but the question is, gentlemen, how much does the

condition of your patient have to do with it? I believe this much, that if you have a good, strong, healthy, active woman, even if you have a lacerated surface or uterus, you would not have any puerperal fever from it.

Dr. E. M. Pond: I think in considering the subject of uterine irrigation we must divide our cases into three kinds. *First*. Those in which we make no examination except the abdominal. That would be a true physiological delivery. And *Second*, those cases in which we have made vaginal examinations alone. And *Third*, those in which we have used instruments or entered the uterine cavity with the hand or other instrument. In the second and third classes in which we have entered the uterine cavity and carried possible infection in some way into it, I think we ought to irrigate.

Dr. Peck: One observation more, and that is in regard to hour-glass contractions and delivery of placenta where you have a retained placenta. The doctor has not found these, but he is going to find them—he is young yet—they are coming, you need not doubt that a minute. Now in delivering the placenta, there is no need of rupturing the membranes at all. You pass your hand inside of the surrounding membranes, where the child was, and you can tell the minute you strike an after-birth whether it is attached to the wall of the uterus, and following along with your fingers with careful manipulation, you can peel off every bit of that retained placenta and not break the membranes at all. All you have got to do is to give—I don't know as I can tell you just what I mean—but give a peculiar kind of squeeze upon it, a sort of push and not break through the membranes and the placenta will slide right along before your hand. In that way you can remove a retained placenta

and not touch the lining of the uterus at all. That has been my experience, and I have done this several times and had no rise of temperature, and had no symptoms whatever of any uterine disturbance.

(Question.) Have you ever had hour-glass contractions except where you have used ergot? I have seen it in my own experience where ergot was used.

Dr. Newell: Well I should say the majority of cases was where I had used ergot.

Dr. Eddy: I have had considerable experience in this business, having had nearly two thousand cases, and what the doctors have said to you I have found true. I first began to give ergot, and in every case of hour-glass contraction it was where ergot had been used, and since I have stopped giving ergot and used something else, I do not remember of having but one case of hour-glass contraction.

I do not remember of having lost a case in child-birth from puerperal fever, as they call it. I think that what Dr. Peck has said about *Puerperal Eclampsia*, has been my experience. The first cases I had—and I had four I think one year—I bled. Afterwards it was recommended to me to use morphine instead of bleeding. I did that and lost more cases than I had before. I am just giving you my experience.

Dr. Newell: I am glad to hear so much discussion on this subject, it shows its importance. I think you will note that I made a distinction in regard to the cases requiring uterine irrigation. I do not recommend them except in cases of severe or instrumental delivery where the hand or instrument necessarily entered the cavity of the womb. And in regard to the hour-glass contractions and retained placenta, I think perhaps

one reason why I have not had them, is because I do not use the ergot until after the third stage of labor is completed. I do very frequently give a full dose of quinine in the last of the second stage of labor which I think answers the purpose without any danger of hour-glass contractions.

I wish to state here if anyone present has never practiced procuring the after-birth by the hand on the wall of the womb, I wish he would try it. You will find no necessity for reaching after the after-birth in the cavity of the vagina, but you will find it a very easy matter in a very large percentage of cases, if not in all of them, to force out the placenta by making careful and persistent manipulation of the womb over the abdominal wall. It should be done at once after the delivery of the child, ten minutes ought not to elapse before securing the after-birth.

TUBERCULOSIS IN THE LOWER ANIMALS AND ITS RELATION TO PUBLIC HEALTH.

BY FRANK A. RICH, V. S., M. D., BURLINGTON.

Tuberculosis has been known and described for many centuries. Four hundred years before Christ, Hippocrates, describing caseous abscesses, so characteristic of tuberculosis, called them tubercles. Since that early age it has been known under a variety of names, and at different periods has been more or less confounded with other infectious diseases.

As early as the middle ages it was considered contagious, and the flesh of animals affected was abandoned as an article of food, although it was not clearly differentiated from syphilis, and later was confounded with glanders; but, more careful investigation showed that while these diseases did resemble each other somewhat in their insidious character and gross post-mortem appearances, yet they were each distinct from the other. Then it was that the theory of heredity began to be advocated. This finally became generally accepted by the profession, and from this time on the idea of contagion was practically abandoned by medical men until Villemin's telling experiments in 1865. The common people of Southern Europe who suffered from the immigration of consumptives to their more healthful climate, and many veterinarians who witnessed its ravages among domesticated animals still held to the

belief in its contagious character, and a few, more fearless, boldly proclaimed it from time to time, with little effect, however, upon the minds of medical men, until the researches of Villemin actually drove them to investigate the matter, either to prove or refute the truth of his assertions, though with more willingness to do the latter. Several entered zealously upon the task, and as the investigation proceeded, many were constantly added to the rank and file and most careful and painstaking experiments were performed, resulting finally, in 1882 in the discovery, by Dr. Robert Koch, of the bacillus tuberculosis and the establishment of its causal relation to tuberculosis.

We find tuberculosis in all the different species of domesticated animals, and even in wild beasts (particularly those in captivity). Among the domesticated animals, it is more prevalent in cattle, fowl and swine than among horses, sheep, dogs and cats, but the latter readily contract the disease when innoculated, either intentionally or accidentally.

The lack of systematic professional inspection of live and slaughtered animals, as well as the actual variations in the extent of the disease in different localities give us somewhat contradictory data regarding the prevalence of bovine tuberculosis.

Probably many of the estimates given by various authors are based on faulty or insufficient data. The following examples may serve to some extent to indicate its prevalence. The extremes are wide, being from 0.02 per cent (among 2,273,547 cattle, mostly steers, killed in the meat inspection districts of the United States from May 15, 1891 to March 1, 1892) to 60 to 70 per cent. (at Hildesheim, Hanover, according to Haarstick). In a large number of German abattoirs, it is

stated that 6.9 per cent. of the cows, 3.6 per cent. of the steers, 2.6 per cent. of the bulls, and 1 per cent. of the young stock were tuberculous. Of 1,270,604 animals slaughtered in German abattoirs from October 1888 to October 1889, 26,352, or 2 per cent. were tuberculous. Careful post-mortems by skilled veterinarians showed 12 per cent. of tuberculous animals out of 12,000 slaughtered in England as affected or exposed to contagious pleuro-pneumonia (a disease entirely distinct from tuberculosis.) In seventeen counties in New York State, the inspectors of the State Board of Health, found 3.4 per cent. tuberculous cattle out of 20,000 inspected. Cattle slaughtered at Baltimore were found tuberculous to the extent of from 2.5 to 3.5 per cent. while of 1,153 cattle from the Eastern States, (mainly New England) slaughtered at Brighton, Massachusetts, 52, or 4.5 per cent. were tuberculous. Salmon and Smith state that "it is not far from the truth to assume that one of every fifty head of cattle in the more densely populated areas of Europe and America is tuberculous." Dr. Salmon states yet later, however, that "the ideas in regard to the prevalence of tuberculosis have been radically changed by the facts brought out in using tuberculin".

The fine showing of the Western abattoirs is mainly due to the fact that the beeves killed there are grown out of doors, are slaughtered while still young, and because as a rule, only healthy animals are shipped to and accepted by them. On the other hand, Eastern and foreign abattoirs more often deal with stall-fed animals and with old cows, in both of which the proportion of disease is higher.

During the present year, in connection with work for the State Board of Agriculture, and in my own private practice, I

have had occasion to test with tuberculin over one thousand head of cattle, besides making physical examinations of many herds. Up to July 1st, out of 941 head of cattle tested from ninety herds, I condemned *222*, and slaughtered and made careful post-mortem examinations on *220*, verifying the diagnosis in every instance, and showing the disease to be distributed in the various parts as follows: Lungs, 82 per cent.; bronchial glands, 61 per cent.; post-pharyngeal glands, 18 per cent.; mesenteric glands, *22* per cent.; lymphatic glands in general, 16 per cent.; portal glands, 6 per cent.; liver, 14 per cent.; intestines, *2* per cent.; udder, *22* per cent.; pleura, 7 per cent.; supermammary glands, *23* per cent.; peritoneum, 3 per cent.; spleen, prescapular gland and testicles each, *2* per cent.; uterus and ovaries each, 1 per cent.

Tuberculosis is exceedingly prevalent in city dairies and herds supplying milk to large towns and cities. The cows are picked up one or two in a place from different herds in the surrounding country. Some of these are infected, and when placed in herds subjected to the predisposing influences of close stabling, artificial feeding and forced lacteal secretion, the disease rapidly spreads throughout the entire herd. The percentage of tuberculous animals among family cows in small villages depends largely upon the prevalence of the disease in the herds from which they are selected. In testing all the cows in the village of East Burke, seventy-seven in number, we found four (5 per cent.) tuberculous, and out of fifty-seven in St. Johnsbury, six (10 per cent.) reacted to the test and were destroyed.

Tuberculosis in the bovine tribe may be local or general. Many of the apparently localized cases, however, prove upon

careful post-mortem examination to be more or less generalized. While all forms of tuberculosis must be considered identical in their origin and the primary lesion in each to be tubercle, clinically we are able to recognize two varieties, acute and chronic, although we rarely get the acute miliary form in cattle; the acute form which we do notice resembling more nearly the acute phthisis of man. It is not very common, but occasionally met with in stables where there is a great abundance of the infection, the animal bearing a strong predisposition to the disease. It is characterized by cough, capricious appetite, rapid emaciation, frequent pulse, increased respiration, constant elevation of temperature and a general cachetic appearance, the end sometimes hastened by colliquative diarrhœa; in short, following a course not unlike its analogue in the human family.

Post-mortem reveals lungs mottled and broken down with large cavities filled with pus and caseous material, bronchial and pharyngeal lymphatic glands diseased, but not so much enlarged as in the chronic form. The intestinal, mucous membrane and mesenteric lymphatic glands are generally involved to a greater or less extent.

The form of tuberculosis most commonly met with in cattle, is decidedly chronic, and might very properly be called chronic disseminated tuberculosis. It is general in character, manifesting itself in a variety of organs, like chronic general tuberculosis in man, but running a much slower course. It is characterized by the formation of numerous isolated or conglomerated nodules, occurring in the serous membranes, in the lymphatic glands, lungs, liver, spleen, intestines, joints, bones, genito-urinary organs and udder. These nodules on the serous membranes are the most characteristic, and it is they which

have given this disease its German name, Perlsucht. They vary in size from that of a small pea to that of a large hen's egg, and are liable to become caseous or ultimately cretaceous. The lymphatic glands are affected generally, especially the pharyngeal, prescapular, bronchial, portal, mesenteric, inguinal and supermammary. The bronchial often grow to enormous dimensions, increasing from one and a half inches to nearly a foot in length. They are very prone to caseous degeneration and calcarious deposition.

The lungs rarely escape infection, varying in extent from a few small caseous nodules in the apex of one or both to the formation of large caseous masses, frequently partially calcefied, and large cavities filled with creamy pultaceous pus, together occupying the greater part of one or both lungs. The ovaries and uterus are not infrequently involved, the interior of the latter in some previously sterile cows being completely studded with tubercular nodules. The udder, and, more particularly, the lymphatic glands in connection with it, show marked infection in quite a large percentage of cases, the frequency of tubercular mastitis being probably due to the great activity of the gland, consequent upon feeding enormous quantities of food calculated to produce the greatest possible amount of milk. Since the most common form of bovine tuberculosis involves any and sometimes nearly all organs of the body, the symptoms are necessarily very various and uncertain, and, singularly enough, not infrequently, entirely absent until late in the disease; and, while writers in veterinary medicine write page upon page, describing the symptoms, and, while it is comparatively easy to make a diagnosis when in the advanced stages, yet it may exist in a cow for months, and even years, she remaining the

source of greatest danger, without presenting to the casual observer, owner or attendant the slightest indication of disease. Incredible as it may seem, animals receiving good care, will, unless the disease be far advanced or developed into the acute form, keep in good condition, feed well, and give a fair amount of apparently normal milk; and yet, when destroyed, an autopsy will reveal extensive tubercular lesions of the lungs, liver, serous membranes, udder, lymphatic glands and sometimes nearly all the viscera. This great difficulty of diagnosis in cattle has always been a source of much annoyance to veterinary examiners, and it was almost impossible to rid a herd of all diseased animals, until the adoption of the tuberculin test. I have tested herds in both New York and Vermont, that had been regularly examined for years by competent veterinarians, and from which all cases easily detected by a physical examination had been carefully weeded out, yet over fifty per cent. of the remaining animals reacted to the tuberculin test, and subsequent post-mortems confirmed the accuracy of the diagnosis in every instance.

This test consists in the hypodermic injection of from ¾ to 3 c. c. of a 10 per cent. solution of tuberculin prepared in a 1 per cent. solution of carbolic acid, the quantity used being regulated by the size, age and temperament of the animal to be tested. Before injection, the temperature is taken several times, one or two hours apart, to ascertain the normal range of temperature. The injection is usually made in the evening and the animals are kept confined and without water during the night and following day. After about eight hours the temperature is taken at intervals of two hours. The normal temperature of cows varies from 99.5 to 102.5, the average

being about 101.5. An increase of two degrees over normal temperature after injection is ground for suspicion, unless there is other evident reason for it, while greater temperature reaction makes the case even more clear.

The action of tuberculin seems to be to cause an active hyperæmia about the tubercular areas and a condition of temporary increased activity of the disease process, accompanied by lassitude, anorexia and often a chill, followed by pyrexia, the temperature suddenly running up from two to eight degrees, where it remains for a few hours, then gradually returns to normal.

Tuberculin was first used as a diagnostic agent in 1891, by Prof. W. Gutmann, of the Veterinary Institute, Dorpat, Russia. The Tuberculosis Commission of the Veterinary Department of the University of Pennsylvania, was the first to use it in this country, late in the same year. Since, many experimenters in this and other countries have employed it and have generally found it a safe and reliable means of diagnosis. It is an extremely delicate test, and great precaution is necessary to rightly interpret results, for apparent reactions, often occur and are apt to mislead the unskillful.

Swine tuberculosis is much more common than is generally supposed. Vœlkel inspected 2,315 hogs slaughtered during three months, in the abattoir at Elbing, and found 91 animals, (nearly 4 per cent.) tuberculous, 89 of which showed both thoracic and abdominal tuberculosis.

My experience with this disease in hogs, during the last eight months, has been principally where I have tested cows, but have found it necessary to destroy over a hundred, besides condemning the meat of several which I have been called upon

to inspect after slaughter, some of which appeared perfectly healthy before death. In most cases, however, hogs affected with tuberculosis are more or less unthrifty owing doubtless to the fact that the disease runs a much more acute and rapid course than in cows. The lungs, abdominal and submaxillary glands are most often affected. The caseous and calcified areas so common in tuberculous organs in the bovine species, are rarely seen in hogs. The lungs soften and break down rapidly, forming large ragged cavities with suppurating walls.

Among fowls, tuberculosis seems to be quite prevalent, and in them also, the disease seems to assume a more acute and purulent form, and is manifested by more unthriftiness than in cattle.

It is occasionally met with in cats and dogs, and less frequently in sheep and horses.

We recognize the bacillus of Koch as the sole exciting cause of tuberculosis in all these different species of animals, but since it is often inactive in the absence of certain essential or predisposing causes, they become of profound clinical importance. The inherited tendency is very pronounced in certain families of lower animals, particularly in cattle and pigs, but actual hereditary transmission of the disease is rare.

Close confinement with imperfect ventilation; faulty breeding, as in and in breeding early, late, frequent and intensive breeding, and in cows excessive milk production, are some of the more common predisposing causes. Nearly every detail of domestication tends to engender feebleness of constitution and consequent predisposition to tuberculosis.

It is not uncommon for a cow from a herd known to be tuberculous when placed in a previously healthy dairy to in-

itiate an outbreak of tuberculosis. Sometimes we find only one or two on each side of such an animal tuberculous, while the rest of the herd will be free from the disease.

On several farms where we found tuberculosis in the dairy, we found it also in the hogs; sometimes in the fowls and barn cats, and on one farm it was necessary to destroy 88 per cent. of a large dairy, all the hogs, chickens, dogs and even the family cat.

What relation does this great prevalence of tuberculosis in the lower animals bear to the public health?

It is obvious that direct experiment on man with tuberculous material from the lower animals is out of the question, but almost innumerable experiments have been made whereby the disease has been successfully transmitted from man to the lower animals, giving the same symptoms and gross post-mortem appearances. Upon microscopical examination, the pathology, morbid histology and bacilli are also identical with those of human tuberculous tissue.

There are on record a great many well authenticated cases of accidental infection of human beings by the products of tuberculous animals. The following are some that have come to my notice, most of which appear in our bulletin 42, recently issued:

Dr. Anderson, of Seeland, reports a case of a babe fed on the milk of a cow having tuberculosis of the udder. The child died at six months with tuberculosis. The mother also developed symptoms of the disease after the child's birth. It was considered that both contracted the disease from the cow's milk.

Ollivier, at a meeting of the Academie de Medicine, of Paris, stated that a patient of his, a young woman, twenty years old, of vigorous health and without constitutional trouble, had acute tubercular meningitis. She had been educated at a boarding school where thirteen pupils had been ill of, and six had died of tuberculosis within a few months. The milk supplied to the school was from cows kept on the place. Upon examination, these animals were found to have tubercular ulcers on their udders, and, after being slaughtered were found to be generally tuberculous.

A Scotch family, all of sturdy health, had a herd of cattle which developed tuberculosis. Two daughters, being young, were brought up on the milk. Their two older brothers were more fond of whiskey than of milk. They are living healthy and hearty, while their two sisters are lying in their graves, victims of tuberculosis.

In the practice of Dr. Stang, of Amorback, a well-developed five-year-old boy, from sound parents, whose ancestors on both sides were free from hereditary taint, succumbed, after a few weeks illness, with acute miliary tuberculosis of the lungs and enormously enlarged mesenteric glands. A short time before the parents had their family cow killed and found her the victim of advanced pulmonary tuberculosis.

Dr. Demme, records the cases of four infants in the Child's Hospital at Berne, the issue of sound parents, without any tuberculous ancestry, that died of intestinal and mesenteric tuberculosis as the result of feeding on the unsterilized milk of tuberculous cows. They were the only cases in which he was able to exclude the possibility of other causes for the disease, but in these he was satisfied that the milk was alone to blame.

The infant son of a college mate of one of us, a comparatively strong and healthy child of twenty-one months, visited his uncle for a week. While there he drank the unsterilized milk of a cow which was soon after condemned and killed in a state of generalized tuberculosis. A few weeks after his return the child began to fail, and died three months after the fatal visit, a mere skeleton, with tabes mesenterica, or consumption of the bowels. A second child brought up on sterilized milk is in robust health. Both parents are in excellent health.

A child four years old, great grandson of Henry Ward Beecher, died last March, at Yonkers, N. Y., of tubercular meningitis. The diagnosis was confirmed by specialists. There were no hereditary tendencies to the disease known. The certainty that he had the disease, and the inability to account for it from human agencies led the physicians to suspect the milk of two Alderney cows on which the child had been mainly fed. Both, the tuberculin test and the post-mortems showed that both animals were tuberculous. Through the kindness of Dr. J. S. Lamkin, of Yonkers, who made both tests and post-mortems, sections of the lungs and a gland were sent to us. They were found to be highly tuberculous.

May 30, '79, a cow died of generalized tuberculosis, in Providence, R. I. The lungs, most of the abdominal viscera, muscular tissue and udder being tuberculous. The milk had been used in the family. In August, the baby was taken sick and died in seven weeks of tubercular meningitis. Post-mortem showed tubercular deposits in the menings of the brain and some in the lungs. Two years later, a two-year-old child in the same family, died of tubercular bronchitis; and seven

years later, a nine-year-old boy, "delicate" for years, died of "quick" consumption. So far as known the family on both sides were rugged and healthy.

Dr. H. M. Pond, reports four cases of tuberculosis in one family, of which three were fatal. He considered the milk of their cows to be the source of the disease, since those animals were apparently tuberculous.

In the spring of 1890, Dr. Gage, city physician of Lowell, Mass., had, as a patient, an infant which died of tubercular meningitis. Its parents were healthy, and surroundings good. It had never been fed anything but the milk of a single cow. The cow's milk was microscopically examined, and found to contain the bacilli of tuberculosis. Guinea pigs inoculated with her milk developed the disease. A second child, fed upon the same milk, was developing similar symptoms to those discovered in the child that died. Dr. Gage could find no way to prevent the sale of the milk unless he bought and paid for the cow out of his own pocket. So far as he knew she was still being used for a milk supply a year later.

The following cases of infection from eating meat, or direct inoculation, may be cited: A woman whose ancestors were without tuberculous taint, ate eleven chickens bought from a neighbor. These chickens had been in the habit of greedily eating the spittle of their consumptive owner. They were but slightly roasted before eaten. The woman soon developed a well-marked case of tuberculosis of the bowels.

Dr. Treon, describes the poor, emaciated, diseased animals furnished to the tribes of Northwestern Indians; how they eat the liver, tallow and entrails raw and fresh, and how the carcass is dried, pounded and packed in skins to be eaten later,

uncooked, even though the animal died of disease. The Indian mortality from consumption is 50 per cent. of all deaths at several points; while at Crow Creek, Dakota, 50 out of the total Indian population of 1,200 die yearly of consumption and scrofula.

Dr. Washington Mathews, spent twenty-one years among the Indians. He states that their food is the primary cause of disease among them, and that when the supply of fresh beef is liberal, the consumption death rate is highest.

Tscherming, attended a veterinarian, who cut his finger during a post-mortem on a tuberculous cow. An ulcerated swelling formed, which on removal proved to be tuberculous, and contained the characteristic bacilli.

Law, reports a case in his personal experience precisely parallel with Tscherming's.

Pfieffer attended a veterinarian of good constitution, without hereditary predisposition, who cut his right thumb deeply during a post-mortem on a tuberculous cow. The wound healed, but remained swollen. A year later, pulmonary tuberculosis had developed, and in two and a half years after the wound, the man died. Post-mortem examination showed tuberculosis of the joint of the wounded thumb and of the lungs.

Dr. Ernst sent a letter of inquiry to about 2,000 medical men and veterinarians of the highest standing. "Out of 1,200 or 1,300 answers received, but two expressed an absolute disbelief in milk as a vehicle for the virus of tuberculosis; there were a large number who expressed their belief in it; a large number who stated, what is perfectly true, the difficulty of

proving such a thing, but expressed their belief in it; and some described cases which they believed were distinctly traceable to the milk coming from tuberculous cows.

I have records of cases of probable infection of children from the milk of mothers with tuberculosis of the lungs and mamma. I have cases of the infection of children from milk coming from tuberculous cows. I have a large number of cases from veterinarians showing the infection of calves from tuberculous cows; and it seems to me that the amount of evidence from the clinical side is very great."

Dr. E. O. Shakespeare, Ex-U. S. Cholera Commissioner, says: "With all its terrors, it (cholera) is not nearly so deadly as is tuberculosis," and "it has been found that in infants and young children in some large cities, the mortality from some form of tuberculosis is far greater than is generally believed, amounting in some localities to one-fifth of the deaths of the young. The significant fact in this connection is that it is most frequently some part of the digestive passages that became first affected."

Case I. Mrs. R., aged 20, using milk from a tuberculous cow, developed symptoms of pulmonary tuberculosis. The cow was exchanged for another, and the young lady apparently recovered. Three years later she suffered from malaria, and became reduced in flesh and strength. She then went to live where the above mentioned tuberculous cow was still owned and milked. Following the advice of her physician, she adopted a milk diet, and in a short time developed acute miliary tuberculosis, from which she died. The cow died a month later, and the autopsy revealed general tuberculosis.

Case II. Mr. D., young man, died of pulmonary tuberculosis. Two years later I tested the family herd and found over 80 per cent. of it tuberculous. It is known that Mr. D., was very fond of milk and used a great deal.

Case III. Mr. C., a young man of healthy parents died of tuberculosis. Three years later I tested cows from which he had used milk. I destroyed over three-fourths of them, all of which were tuberculous, and many of them proved to be general.

Parents of the last three mentioned cases are all living, and they give no family history of the disease.

Case IV. Mr. T., cut his finger on a spicula of bone while making post-mortems on tuberculous cows. A few months later he developed a tuberculous joint.

Tubercles and tubercle bacilli are present in muscles of beef in only a small percentage of cases, but are often present in the small lymphatic glands of the intermuscular areolar tissue. These are included in steaks and roasts.

In tuberculous pork the danger is far greater, for tubercles appear not only in the lymphatic glands but in the muscle itself. The livers of both cattle and hogs, so commonly eaten now-a-days, are tuberculous in a very large number of cases. These glands are often completely filled with miliary tubercles, yet to the naked eye appear normal, being detected only by microscopical examination or careful inspection of the portal lymphatics.

Milk is more to be dreaded than meat because the udder of the cow is often the seat of tuberculosis. 22 per cent. of the tuberculous cows destroyed in Vermont during the past eight months had tuberculosis of the udder, as revealed by

post-mortem examination. In some herds from fifty to seventy-five per cent. had tuberculosis of mammæ and associated lymphatic glands. Even in the absence of tuberculosis of the udder the milk is sometimes infectious. Koch and Nocard failed to infect animals with milk from cows with apparently sound udders. On the other hand, Bang, Hirschberger, Ernst and Peters, Smith, Kilburn and Law all succeeded in infecting animals with milk of tuberculous cows whose udders were perfectly sound.

Prof. Bang, of Copenhagan, successfully inoculated animals with milk from 9 out of 63 cows selected for their sound udders.

The conclusions drawn by Drs. Ernst and Peters, of Boston, who carried out most carefully a long series of experiments with the milk of tuberculous cows, are:

"*First*, and emphatically, that the milk from cows affected with tuberculosis in any part of the body may contain the virus of the disease.

Second. That the virus is present whether there is disease of the udder or not.

Third. That there is no ground for the assertion that there must be a lesion of the udder before the milk can contain the infection of tuberculosis.

Fourth. That on the contrary, the bacilli of tuberculosis are present and active in a very large proportion of cases in the milk of cows affected with tuberculosis but with no discoverable lesion of the udder."

It seems to be quite generally believed that the ordinary cooking of meat renders it entirely innoxious. But, the interior of rare steaks and roasts is not heated sufficiently to

destroy tubercle bacilli. In a few instances successful inoculations upon small animals have been made with thoroughly cooked tuberculous material. Practically, however, boiling for half an hour destroys all germ life, and "well-done" meat will not infect. There is another feature in the case which has been largely overlooked in the past: the life products of the bacteria, or ptomaines are not rendered inert by heat, so there still remains the possibility of septic intoxication. The same is true of milk sterilization. Boiling for half an hour practically destroys germ life, but these bacteria proteins derived from the bodies of tubercle bacilli, and which form the basis of Koch's lymph or tuberculin, not only withstand heat but are probably made the more available by its action. So alike in sterilized tuberculous meat and milk there remains chemical bacterial products, which though only slightly toxic for healthy persons are highly so for tuberculous human beings and animals, producing remarkable reactions and modifications of tuberculous lesions. It was these micro-proteins which Robert Koch hoped to prove of inestimable therapeutic value in the treatment of tuberculosis. It is they which give to tuberculin its peculiar value as a diagnostic agent. In both, its action is almost invariably in and about tuberculous areas, producing there positive chemitoxis, renewed or increased activity of the disease process, with new extension, and frequently converting a chronic or latent tuberculosis into an acute and rapidly fatal type of the disease. This is true of the effect of tuberculin on all animals, but man is manifestly more susceptible [to the poison than most lower animals; he is many times more susceptible] than even the guinea pig. These micro-proteins being generally diffused throughout the body

of a tuberculous subject, exist in its products; and, those consuming such products, even though they are sterilized, are taking small doses of tuberculin, and if they are already tuberculous the effect may be to aggravate and extend the disease.

Mortality statistics show that 14 per cent. of all deaths result from tuberculosis. Who dares to attempt to estimate the number we should add to this to cover the many cases cured by treatment, change of climate, etc., and the thousands of cases of localized tubercle, as lupus, scrofuloderma and anatomical tubercle, dying at last from other causes; and the many thousands more of such localized cases as tubercular cervical and other lymphatic glands, osteomyelitis, white swelling, hip-joint disease, fistula in ano and many others cured by timely surgical interference. Who dares attempt to estimate the sum total, when all these are added to the almost incredible number who actually die from tuberculosis? yet the least of them do require the presence of the tubercle infection just as certainly as does the case which dies from acute miliary tuberculosis or acute pulmonary phthisis. Thus it would seem that the human system is equally, if not more, susceptible to the invasion of this infection than that of any of the lower animals. In this and in many other countries, cows' milk and its products enter more or less into the constant diet of nearly every family, while many individuals, by reason of disease or tender age, subsist for the most part upon it.

Mothers of strumous diathesis or otherwise delicate health will refrain from nursing their children, and physicians uphold them in so doing, yet tuberculosis of the human mammary gland is so extremely rare that Dr. Hubermaas was able to collect records of only eight cases, while in the bovine tribe it

is as conspicuous for its frequency of occurrence, and nearly every milkman peddles its fruits. Again it is routine practice to place patients upon milk diet during the course of, and convalescent from, nearly all diseases when by reason of lowered vitality they are temporarily predisposed to tuberculosis, thus combining the most favorable conditions for the implantation of this active germ.

Cattle contract tuberculosis one from another, and sometimes from a phthisical attendant expectorating on the stable floors, the dust of which is inhaled as well as taken with the animal's food.

Swine receive the infection through milk from tuberculous cows, from eating tuberculous carcasses and viscera, as well as from each other.

Fowls are infected by eating tuberculous milk and its products, picking up grain from the droppings of tuberculous cattle and pigs, from each other, and from sputa of consumptives carelessly expectorated about yards, barns, etc., which is so greedily devoured by poultry.

The sources by which man is infected is a consummation of all these, with many more, for the beef, pork, fowl, milk, butter, cheese, and the diseased viscera, as the liver, kidneys, etc., do form the principal articles of his diet. He eats them, he assimilates them, and he becomes infected by them.

Milk is probably the greatest disseminator of tuberculosis of all of the above mentioned mediums. This inference is well supported by the showing that the disease, in all its forms, is relatively much less prevalent in those countries where there are few or no cattle, as Hebrides, Iceland, New Foundland, Algiers, Interior South Africa, parts of Ecuador and

Peru, and Islands of the Pacific; where they are only kept for beef, as in Eastern Peru; or for manure, as in parts of Russia; where milk of reindeer is used instead, as in Northern Norway, Sweden, Finland, Lapland and Greenland, and where goats and mares furnish the milk, as on the Kirghes Steppes.

While there is a pretence at inspection at our great packing centers, there is little, if any, elsewhere in this country. Our home dressed beef consists principally of old, worn-out, gargety or sterile cows, an alarmingly large percentage of which are tuberculous.

The hind quarters will usually pass detection, which together with such fore-quarters as can be trimmed up and made passable, are sold in our markets. Some parts that will not bear passing scrutiny in the market are converted into sausage or canned, while such as are too far gone for this, are together with all the diseased viscera and other slaughter-house refuse fed to a drove of hogs kept for that purpose, which in turn contract tuberculosis, are slaughtered and sold in our markets; thus little infection fails to reach some unfortunate home.

How can the physician hope to meet with any degree of success in the treatment of the various forms of tuberculosis when his patients are constantly taking the infection into their system, to say nothing of the continued accessions of tuberculin (equivalent to Koch's treatment) which after so thorough and extensive trial, costing the lives of thousands, had to be abandoned? Yet this is just what is taking place to-day in every town in the State of Vermont. Three millions die annually of tuberculosis, and it has headed mortality statistics for years, yet is looked upon as something inevitable, while a

single case of small pox or cholera creates the greatest alarm.

It has been well said that "if the 5,490 deaths from tuberculosis which occur every year in the city of New York, could be brought together in an epidemic lasting but one week, no small pox, cholera or yellow fever scare would approach the panic which would thus be created, if we take the whole civilized world and compare with the tuberculosis mortality, all the accumulated deaths from war, famine, plague, cholera, yellow fever and small pox, the latter are comparatively very insignificant."

It would be impossible, in a paper of this character, to discuss at length the measures necessary or feasible for the prevention or amelioration of this alarming source of danger to public health, so I shall only briefly allude to what I consider to be the proper course to take in the matter. With the enactment and enforcement of measures in keeping with the facilities at hand, I believe that the danger from this source might be reduced to a minimum, for in the tuberculin test we possess a thoroughly reliable means of diagnosis of tuberculosis in all animals. To make it available, three things are necessary: suitable legislation, adequate appropriations, and skillful and careful men to make its application.

Furthermore, there should be provision for the prompt destruction of all animals found to be tuberculous, and thorough disinfection of all buildings and utensils. This question involves a mass of such details as organization for action, reimbursement of stock owners, etc., not within the scope of this paper, but subject to the careful consideration of sanitarians and legislators.

In addition, every municipality should be provided with a public abattoir, where all animals slaughtered for the home market must be subject to the inspection of a competent veterinarian; such inspection extending to all viscera as well as to the carcasses. No canned meat or meat shipped from other points, as our great packing centers, should be allowed to be sold in the markets of such municipalities, unless previously inspected by skillful and reliable examiners, and, certificates furnished to that effect.

In conclusion, I entreat you, as practitioners of medicine, in the management of all your cases of tuberculosis to see to it that fuel is not constantly added to the flame by accessions of the infection and poisonous ptomaines.

I furthermore ask you, as citizens, as physicians and as conservators of public health, to lend your influence to encourage further investigation of this matter, and legislation, if needs be, whereby we shall be less exposed to this most dreaded disease.

DISCUSSION.

Dr. J. H. Linsley: *Mr. President, and Gentlemen of the State Medical Society:* The subject of Tuberculosis cannot possibly be exhausted by any discussion which we can here offer for several days. At the same time the other papers demand attention and on that account I shall say but a few words in regard to tuberculosis.

The paper, the able paper by Dr. Rich, to those of us who have not known something about this work before, is remarkable—it is astonishing, and I think naturally increases our fear of this disease.

A few words in regard to the difference between tuberculosis in the human subject and bovine tuberculosis may be of interest. At the request of Dr. Rich at the time of the destruction of the herd or of part of the herd at the Experiment Station, a number of the tubercular tissues were examined by me; they were properly hardened and stained and examined under the microscope.

It is true that the effect of tubercle bacilli on the tissues is very much slower in cattle than in man. I do not know exactly how to account for this. It may be due in part to the difference in circulation.

The effect of the growth of tubercular tissue is to produce, sooner or later, an endarteritis of the vessels.

(Dr. Linsley here suspends his discussion until after the examination by the attending physicians of the specimens furnished by Dr. Rich.)

I was speaking, gentlemen, of the difference in the lesions of tuberculosis in cattle and in man, and I said that the process is a slower one as developed in cattle than as developed in man, and that there are several factors that made this difference, among which may be the difference in circulation; and again, it is probably due in part to the fewer number of pyogenic bacteria in or about cattle than in or about man. I further stated that one of the first results of the growth of tuberculosis is the production of an endarteritis and it becomes in the majority of cases obliterating. This, of course, stops the blood supply to the parts and as a consequence we have almost the same thing as in infarction (?) i. e., we have the death of these parts but we do not have the suppuration of tissue unless pyogenic bacteria are present.

Now an interesting point comes up in regard to intestinal tuberculosis and it is a point which I would like Dr. Rich to speak about, though he may have spoken of it in his paper, but I do not remember of hearing it, and that is if the intestinal tuberculosis which he found was not more prevalent in calves that were fed on milk from mothers who were affected with tuberculosis. Of course the cattle are not as liable to have intestinal tuberculosis as man because of the different character of their food, but still a source of infection is the swallowing by cattle of the tuberculous matter that may be raised from the lungs. They do not expectorate, of course.

Intestinal tuberculosis in New York is not uncommon. It is more common than it was. In many of the children in the hospitals, in the children's hospital, intestinal tuberculosis, until within a few years, was common, and I believe gentlemen, that to-day we have many more cases of intestinal tuberculosis than we know of. I do not think we recognize it all. I think that a great many cases of intestinal tuberculosis are called chronic diarrhœa. I know that I have examined the fæces of a number of cases, in which the diagnosis of chronic diarrhœa was given, and demonstrated the presence of tubercle bacilli, and an autopsy demonstrated the presence of intestinal tuberculosis. It is perfectly practicable to demonstrate the tubercle bacilli in fæces milk or urine, and by this procedure you can make the diagnosis, I think, very much earlier in the disease than in any other way. I do not mean to convey the impression that it is absolutely necessary to have diarrhœa with intestinal tuberculosis. Those cases that have diarrhœa come more to the notice of the practitioner earlier than other cases where this feature does not exist.

Now the question of immunity is an interesting one and is about the only feature which has not been mentioned. In regard to the principal theories, the President, in his able paper last evening spoke of there being a pre-tubercular stage or a morbid condition the existence of which was favorable to the reception and growth of tubercle bacilli. Now that something, that condition, is viewed in two different ways. The French school under the lead of Metschnikoff, who is now Pasteur's first assistant, believes in the phagocytic theory. In other words, that where the animal is immune, certain of his white blood cells have the power to attack these germs, one of the points being in the tonsils and other lymph nodes and nodules about the orifices and mucous membranes of the body, absorbing them, digesting them, and throwing them out by means of the excretory organs; that they are particularly the grave-yard or the cemetery of innumerable numbers of micro-organisms. Then comes the German theory of this something, this quality of immunity, resting in the blood serum; that the animals which are immune have a blood serum which if abstracted from the blood will not grow the particular germ from which they are immune. I believe neither of these points are settled. The fact of the tonsils being one of the safeguards of the body we can readily believe because we know what an active circulation we have in them. They are simply masses of lymphatic tissue. I believe that this German theory of immunity is more generally believed today, more accepted than the Metschnikoff theory. The Metschnikoff theory is a beautiful one, but I believe it has not been demonstrated absolutely, nor has the other as far as that goes, there are a great

many arguments pro and con and I think the weight of the argument today is in favor of the serum as having the property of resistance.

In speaking of the examination of cattle we certainly could take a good lesson from the Jews. As you all know they are very careful, scrupulously careful, in regard to the examination of all meat, at least I know they are down our way, and that their priest examines every bit of meat that is to be used in their families at the time it is killed, and if there is any question about an enlarged gland or anything of that kind, they are simply thrown out.

I will not take up the time of the Society any longer in speaking of this matter.

Dr. H. D. Holton: *Mr. President and Gentlemen*: I think this is a very valuable paper and the specimens too I think are very valuable as making us all more familiar by the sense of sight rather than by the sense of hearing, although the President's paper was very plain and explicit.

This is a matter of great importance and I would like to ask Dr. Rich how freely these books have been distributed over the State, if he knows?

Dr. Rich: Ten thousand have been published and they will continue to be published as long as they are wanted. It is expected to place one in the hands of every physician in the State. At least seventeen thousand will be issued.

Dr. Holton: I received one some time ago and thought it was a very valuable paper and I thought it should be in the hands of every practicing physician.

In regard to legislation upon this subject, now while I doubt the wisdom of the Society's taking any action in regard

to the legislation on this subject, yet I think that Dr. Rich and Prof. Hill of the State board, who are more familiar with this matter, should ask of the legislature such legislation as they believe is needed to aid them in their work.

I think there should be some way, I merely make this as a suggestion, in which the milk of dairies that is supplied to towns should be examined bacteriologically. It seems to me that greater safety would be provided for the citizens in that way, than would be done by the testing of animals themselves, that is, it would be more likely to be done than it would if you asked to have all the herds examined by themselves, and I understand it is perfectly feasible to examine the milk. It could be done once in three months, or as the Board thought desirable and that would protect the towns that are supplied. Of course it would not reach individuals who keep cows for their own families.

In the discussion last night one thing came into my mind and the Doctor touched upon it this morning, that tuberculosis was not as prevalent where cow's milk and beef were not used. We have known for a good while that in Russia where the mare's milk is used, and in those countries where goat's milk is used that consumption did not seem to be so prevalent, and if the parties affected by it have ever used the kumyss from the mare's milk they usually recover. The ass is less liable than any other animal to tuberculosis.

Last night a great deal of surprise was expressed, and I confess I share in it, that we have not all died on the globe long ago from tuberculosis, with the bacilli floating around so freely and we all swallowing so many of them.

I think this is a very important subject and I hope that Dr. Rich and the Experiment station will continue their experiments and report to the society so that we know if there is any easier way than to have Dr. Rich go all over the State to test herds. This is a practical way in one way but an expensive way and he cannot go everywhere. I also think there should be some tuberculin matter distributed throughout the State at certain points for experiments, or the milk should be examined.

I want to thank Dr. Rich for his very valuable paper and also Dr. Linsley for his able discussion of the subject.

Dr. C. W. Peck: *Mr. President and Gentlemen of the Society*: I hope you will excuse me for expressing my profound ignorance of the condition of affairs. I feel as though we were standing over an infernal volcano. This is a hellish object lesson to the citizens of Vermont. I did not realize that we were in such a condition. This book (indicating) is the first time I have ever seen anything published on the subject; and in conversation with others who know more about this subject, it is just beginning to dawn upon me what condition we are in.

I am hopping right up out of a night-mare, so to speak, but I think gentlemen, something should be done. The State of Vermont is responsible from this minute, that is as I look at it, and probably has been responsible for a long time.

I know that in my own town there is a herd of cows and that some of them come from the Moulton farm. I did not know anything about this herd but my fears are much aroused from the testimony I get here.

We, as medical men, have no business to sit still and see this thing go on, and gentlemen, there is no time but now.

I knew nothing of this condition of our cattle. Why, good heavens and earth, just think where we are; the cattle in this State in that condition, (pointing to specimens.) Who knows but that is the condition of your cow or mine and I have two and I wish they were both dead; and if they were dead, where should I get another. We can't go without milk; it is the most important article of food we have got, and just look at the condition of the milk we have. Can any man look on that specimen and doubt but that the whole system of the animal was impregnated? And this cow, as I understand, was a healthy, sleek, fine looking animal and furnished nutriment for four little children. Just think of it. It is all well enough when another man's bull is hooking, but supposing it was your family, and it is likely to be your family. Gentlemen, it is an accursed earth-quake that is rolling under this State and the sooner the Legislature and the medical men of this State take hold of it, the better; and as I said before there is no time but now. You remember this is the first time it has dawned upon me. I think the Legislature should take hold of this thing and make it possible for men who have cows to settle this question and put an end to it. Just think of it, because of one cow that came from the Moulton herd the purchaser has slaughtered eighteen in consequence of this condition. Can you show any such record! Was ever any other such record known? And here we are hugging this cussed delusive phantom of hope, thinking we will get out of it. Can you ever do it as easy as you can to-day? Will there be a time when you can arrest the destruction of your cattle as well as now.

I would suggest that a committee of three or four or five, and they should be men who are persistent and mean business,

should be appointed by this meeting to-day to go before the legislature with a suitable bill, and gentlemen, go to stay, do not hesitate, walk right straight up and take hold of that body of men and make them understand the significance of this matter. Bring them in here, or, take that (the specimens produced by Dr. Rich) to the State Legislature and show it to them. Men are slow to come to convictions, but when they do come to convictions in this State, they will act as well as any other men in the Union.

I would like to have this same committee, whoever they are, publish United States to the citizens of Vermont, give them an article as free from medical terms as possible, talk it so farmers can sit down and read the article, give them a statement of plain ungarnished facts. Why, good heavens and earth. Ought not they to protect their families? Do you think the families of the State of Vermont will be slow in understanding the subject when it is put before them? And if the State of Vermont fails to act, gentlemen, it is in my estimation responsible for the result of that failure.

Dr. C. S. Caverly: *Mr. President and Gentlemen:* The State Board of Health, and I think the State Board of Agriculture, and Dr. Rich, and anybody who has any official connection with any Board that has anything to do with this matter, has been very glad to listen to the speech of Dr. Peck of Brandon, but I am surprised that he has said he has never heard of this thing before, because I did not suppose there was a medical man in the State of Vermont that did not know it. The general medical literature, as well as the special literature of the country, has been full of it for the last three

or four years, and we who are connected with public health matters have heard it, and heard it, and heard it.

There is no question but that the State Legislature of Vermont are very slow and conservative in acting upon a question of this kind, and there is no doubt but that, if we had a Legislature made up of men who had seen these specimens, if made up of such men as Dr. Rich himself, some active measures would be adopted.

The State Legislature of New York State, some three or four years ago made an appropriation by which they authorized their State Board of Health to examine every herd of cattle for which proper application was made, and in case they got the proper reaction, to slaughter the cattle and recompense the owner of the cattle, so much for a grade cow and so much for an ordinary cow. Now that worked very well for a short time but the thing overwhelmed them immediately. They found it was going to take ten, twenty or one hundred times as much money as the Legislature had given them; and that tuberculous disease was so common that it was out of the question to treat it in this way.

What we need is to educate the people; we have got to let them see such an object-lesson as this which we have seen this morning. There is no question but that it is a very convincing object-lesson, when we see such a condition of things as that in an apparently healthy cow or animal and there is no safety to the people in this State, until the cows in the State have been tested. There is no safety for the children or for invalids, especially those who are dependent on a milk diet.

There is no harm in putting this thing before the Legislature. It is an excellent thing to do, and it is an excellent

thing to suggest that a committee go and stay with them, but I do not believe there is one present that will go and stay with them, simply because we cannot afford to do it; but we can go and talk to them; we can talk to them on every occasion, where ever we see them, and we can do what the State Board of Health has already done. They have published a circular on the disease and that has been sent to every town and health officer.

I am sure the subject is an all-important one. We are all of us very much interested, especially the State Board of Health, and the State Board of Health as far as its appropriation goes will do everything in its power to bring this to public notice, and will do all it can to stamp it out.

I understand that the State Board of Agriculture, which is also a Board of County Commissioners in this State, are authorized to examine any or every herd whose owners want them examined, and in case that owner will give a bond that any found to be tuberculous by the tuberculin test, any that respond to the action, in case the owner gives a bond that such cattle be slaughtered, that it will give the test freely. Now this is a fair proposal, a fair offer to everybody in the State. Dr. Peck can go right to Mr. Winslow and have his cow tested and any of us can have this sort of thing done. This is one of the points which I intended to have Dr. Rich explain.

Dr. Jackson: *Mr. President and Gentlemen*: It seems to me very proper that this medical society should put itself upon record in regard to the matter which has been so ably presented to us this morning by the very able paper of Dr. Rich.

It is not altogether new to us because we have received our education through Dr. Rich and through those who have been engaged with him in disseminating this knowledge.

In conversation with Dr. Holton and others who have been connected with the Vermont Legislature, it is thought best that any resolution we shall make shall be in the way of a recommendation and not place us in a position, as is so often the case and has been in times past, where we, as a medical society, have offered resolutions or introduced resolutions, when the wise men, and many of them are not only wise but also will carry out their wise ideas, at once say "now this is a piece of class legislation, this is done for the benefit of the Doctors," when we know that we have made the attempt as the servitors of the public well being.

This is simply a rough outline which will answer for the beginning: RESOLVED, that this Society recommend the State Board of Health to present such suggestion to the Vermont Legislature as will lead to the protection of the public from tuberculous infection from the lower animals."* Now any change in this, or any modifications, I should be very glad to hear.

I know this Society would be glad to put itself upon record in favor of anything that can be done, at any expense, for the preservation of the public health.

DR. E. F. UPHAM: *Mr. President and Gentlemen*: It is not necessary for me to say anything, I am not a good talker. In relation to this matter of tuberculosis, animal and human, I have some ideas and if I can possibly get around them so that the subject will present itself to your minds as it does to mine,

*The resolution was unanimously adopted.

I shall have the satisfaction of having added a little to what I believe to be a preventive, which is all we can do as Doctors, I suppose. Although we may do a great deal in the way of cure, yet prevention is proved to be a good deal better.

I have had object lessons of the animal. Now we all understand that a very small part of the milk supply that is furnished the State of Vermont, comes from large herds. I have no objections to this being restricted and I have no fault to find with the tuberculin theory and no cold water to throw on it, but we must remember that cause produced its effect, and beginning with this animal tuberculosis, how long it has been coming of course I do not know and how long it has been coming in Vermont I do not know. I have had a sort of observation of the Green Mountain Stock Farm from its inception, from its commencement, and of the methods that have been used and the treatment that the animals have received. It is a settled principle, I suppose, human and animal, that if you restrict pure air, force a diet, over-stimulate, that you introduce a condition that is liable to produce disease, whether it is in animal or in man. The great object has been at this farm in introducing Jerseys, the great object of the Green Mountain Stock Farm has been and is to produce a set of cows that will make the greatest amount of butter regardless of anything else. That is the object, to make the butter and send to New York and get the most money possible out of it. These animals have been fed to their utmost capacity; they have been treated as machines. All the grain that they could digest has been put into them, and cotton seed meal. They havn't been allowed air or exercise in anything like a healthful degree and the result has been that there has been disease in that herd. I

have known of the situation and I have known that there was death after death of animals in that herd that nobody else knew anything about. I knew they were under treatment very frequently, under their own treatment and that of scientific men.

Well, that condition of things gentlemen, has produced its result in that herd and they have had sales and they have introduced that set of animals in grades, so they are distributed in that community.

Now it seems to me gentlemen, that whatever we should recommend, we should take into consideration that the direct principle should be taught. We may kill and take off and recommend the Legislature to slaughter these herds but we have not got to the root of the injury. We may make all our suggestions but if we neglect the first principle to establish a a thoroughly healthy condition, we fail.

CERTAIN PHASES AND COMPLICATIONS OF HEART DISEASE.

BY E. H. MARTIN, MIDDLEBURY.

The bountiful provision of nature in giving to the body a double set of most of the important viscera, allows in many cases, even extensive injury and disease of one of the organs thus duplicated, without interference with life. A kidney or lung may be obliterated and even a lobe of the brain may be seriously damaged, and still the vital functions persist. Because the heart is the most notable exception to nature's bounty in this respect, because it is surpassed by no viscus in indispensability to the organism, and because its diseases are relatively very frequent, the study of its pathological conditions and their complications, possesses a peculiar and every-day importance. The fact that it is the most wonderful and complete piece of machinery in the body, gives to its disorders added interest to one of a mechanical bent and demands the exercise of special skill in their diagnosis and treatment. The reasons given shall be my excuse for briefly discussing a few of the phases and complications of organic heart disease which have been especially emphasized in my experience, with very general allusions to their causation, diagnosis and treatment. As introductory to the special cases to be cited later on, I would

like to preface with a few remarks upon the subject in general, even at the risk of repeating what is trite to many of my listeners.

It is commonly understood, and rightly, that rheumatism and the rheumatic diathesis are the most common causes of heart disease, but the fact, not always stated in treatises on the subject, remains true that many, and, according to my experience, a majority of cases are not thus clinically explainable, nor in many cases can any cause whatever be assigned for the disease.

Organic heart diseases naturally divide clinically into two great classes—the valvular, characterized by organic murmurs and those, scarcely less numerous and fatal, not so characterized. It is safe to say that under the age of fifty, the valvular diseases greatly preponderate, but over that age the cases without murmur are the most numerous. But aside from the presence or absence of the murmurs, these two great groups scarcely differ in their more important phenomena from one another. Both are attended with hypertrophy and each is liable to the same symptoms of failing compensation, dropsy, dyspnœa and cyanosis, and finally they are subject to the same sequels and to the same fatal issue. The symptoms of heart disease, the same murmurs, the increased force or weakness, deflexion of the apex downward and to the left, increased area of dullness, irregularities in rythm, and in advanced cases œdema, cyanosis and dyspnœa, naturally fall apart into four groups. *First*, Signs of valvular lesions. *Second*, Signs of hypertrophy. *Third*, Symptoms of imperfect compensation. *Fourth*, Symptoms of impaired innervation. It often happens that the student in medicine has his attention so concentrated on the valvular mur-

murs that he fails to fully understand the true *relative* value of these four groups of signs, and so it comes about that he lays too much stress upon the presence or absence of the murmurs in a diagnostic and prognostic point of view. I speak from vivid personal recollection. The loudness of the murmur is by no means proportional to the gravity of the case, for it is obvious that a small irregularity of a valve so situated as to cause very slight obstruction or none at all, may be the cause of a loud murmur, while on the other hand it must not be forgotten that fatal disease may exist without murmur. It would be better if the attention of the practitioner were more focused on the hypertrophy, for, among the groups of signs enumerated, those indicative of enlargement are the most significant of serious disease. To state the matter forcibly and concisely we may say, that valvular murmur without hypertrophy is of little or no gravity, but hypertrophy with or without murmur is grave. When hypertrophy exists it is always for a purpose, and that purpose is to compensate for extra work which the heart is obliged to do, in order to overcome mechanical difficulties, whether due to alterations in its own structure, to a morbid nervous supply, to changes in the arterial system, or to prolonged and excessive muscular exertion (as in the "soldier's heart"). Hence it is that the hypertrophy, although in itself salutary, is the index of the extent of the disease, and when, in addition to the signs of that condition, are added the symptoms indicative of failure of compensation, the danger is indeed great. Hypertrophy, dyspnœa and œdema, whether explainable or not are an ominous symptom-complex. As examples of grave heart disease without valvular lesion, I have under observation at the present time, two cases in women be-

tween 50 and 60 years of age. Both have extreme irregularity of the heart's action with marked hypertrophy and dyspnœa. No valvular murmurs are discoverable. Both have had the signs of failing compensation, dropsy, orthopnœa and albuminuria. One of them has been the subject of repeated cerebral embolisms and will be alluded to more fully further on. In these cases the enlargement seems to be compensatory for the mechanical disadvantage caused by the irregular action, a kind of compensation sometimes overlooked by authors. In senile cases and in chronic interstitial nephritis, the hypertrophy seems to be due to obstructed circulation from changes in the arterial system.

In no class of diseases are there so many departures from the conventional type as in heart lesions. In its complications too, since the vascular system permeates every structure, there is no organ in the body so remote as to be without danger of secondary, consequent involvement. Of all the complications none are more frequent or better understood than albuminuria. Chronic Bright's and organic heart disease are so linked in with one another that no examination of one is complete, unless it includes both. Cases which are primarily cardiac, almost invariably in some stage, are complicated with signs of kidney disease, and *vice versa*. Indeed chronic interstitial nephritis, characterized as it is by cardiac hypertrophy, dyspnœa and increased arterial tension, is considered by many, and with reason, not as a disease of the kidney but as a general disease, from whose influence hardly an organ in the body is exempt. Finally it is when the kidneys, by diminished activity, begin to show their sympathy with the cardiac lesion,

that dropsy, one of the most dreaded symptoms of impaired compensation, makes its appearance.

One of the most terrible sequels of heart disease which it has been my lot to meet, is embolism. Obviously this is a complication which may affect any organ in the body, and I query if it is not much more frequent than is generally supposed. In many cases of sudden death of those suffering from cardiac disease, which are referred in a vague way to "heart disease", would not a *post mortem* examination of the brain show an embolism or hemorrhage? The most appalling death from heart disease and its sequels I have ever met was the following: Case I. Miss A—, age 26, had in April, 1889, an attack of subacute rheumatism from which she recovered without special incident, under the usual treatment with alkalies and salicylates. There were no signs of cardiac trouble, and she remained well until the summer of 1893. In the middle of July of that year, I found her suffering from malaise, fever and slight dyspnœa. She gave a history of several suffocative attacks upon exertion a short time before I saw her. Physical examination revealed a loud systolic murmur, heard plainest at the base—aortic stenosis—together with the signs of marked hypertrophy. The heart's action was very strong, the apex deflected downward and to the left, and the area of dullness much increased. The fever persisted in a moderate degree for several weeks but finally under alkaline and supportive treatment, she became apyretic and convalescence seemed about to be established, when, the morning of Aug. 11, I found her complaining bitterly of pain in her right foot and leg. Examination disclosed unnatural pallor of the extremity, and there was no pulsation in the popliteal artery or below. Pulsation in the

femoral was normal. Auscultation now showed the roughness of the valvular murmur markedly diminished. Next day purple discoloration of the entire foot had ensued, and this was slowly followed by the other signs of gangrene. The slough took the shape of a slipper of somewhat irregular shape, but involving the entire sole of the foot, all the toes and a portion of the dorsum. The case progressed slowly and with subacute symptoms for three weeks, and a well-marked line of demarkation formed, but the patient's general condition became gradually worse. The valves of the heart also gave evidence of even more extensive disease until murmurs heard with both sounds could be heard all over the chest. There was no dropsy or cyanosis and only slight dyspnœa. Finally on Sept. 1, at a consultation it was decided that amputation might give a slightly better chance for recovery. The operation was eagerly desired by the patient and her friends, although they were given distinctly to understand the almost hopeless nature of the undertaking. Accordingly the next morning the leg was removed at the upper third. Sideflaps consisting of both skin and muscle, were made to ensure better blood supply. When the elastic band was removed, visible arteries having been tied, not a drop of blood flowed, a circumstance which augured badly for the outcome of the case. The patient bore the ether and the operation extraordinarily well and her condition for the next few days seemed none the worse, but at the first dressing on the sixth day, there was found on the anterior flap an isosceles triangle of discoloration with sides about two inches in length. In the rest of the wound, union was taking place in a satisfactory manner. All sutures were removed, but the gangrene slowly spread until the whole of both flaps were in-

volved. A re-amputation was thought of and desired by the plucky patient, but examination of the femoral artery now showed it to be occluded, probably by progressive secondary thrombosis, as far as its origin at Ponparts ligament. Just above the ligament the pulsation of the external iliac could be plainly felt. As it was impossible to operate above the obstruction and no line of demarkation was now present, operation was refused. The wisdom of the decision was demonstrated, when in a few days, in spite of care on the part of the nurse, enormous and rapidly extending bed-sores developed over the bony prominences, and finally death took place from asthenia, four weeks after operation. The patient remained conscious and extremely alive to her situation to the last. This melancholy but rare and very instructive case, was evidently one of vegetative endocarditis in an active stage. A vegetation on the aortic valve became detached and was carried into the femoral artery. This explains why the murmur became softened after the embolism occurred. An interesting fact of practical importance, was the excellent manner in which she took the ether. Her pulse was actually stronger and less frequent during and immediately after the administration of the anesthetic. Surely we need not always fear to give ether to one suffering from cardiac disease! The collateral circulation had become sufficiently established to form the line of demarkation, but when some of the vessels were unavoidably severed in the amputation, it was not enough to nourish the flaps. It is quite possible that an amputation higher up, e. g. in the thigh, might have been more successful, though surgical writers are agreed that such cases seldom recover, either with or

without operation, and some authors maintain that surgical interference should be withheld altogether.

Case II. Mrs. B—, aged 58, previous health fair but not robust, somewhat anæmic, was first seen professionally for the disease in question in June 1892. She complained of great dyspnœa, amounting to orthopnœa. Physical examination—no valvular murmurs, heart's apex moderately displaced downward and to the left, and area of dullness increased. The heart's beats were extremely irregular, so that it was simply impossible to count the pulse, though it was estimated at 130 per minute. Under appropriate treatment the dyspnœa and irregularity became less and she got up about the house, but her heart was still very irregular, and moderate exercise brought on dyspnœa. She has a very small goitre, which has remained stationary for many years. No protrusion of the eyeballs. In the spring of 1893, she had a mild and transitory apoplectiform attack in which she fell to the floor, had hemiplegia of a few hours duration, but did not at any time lose consciousness. The attack was instantaneous, not gradually developed. Some months later I was called to see her and found a considerable œdema of the legs and feet and a moderate amount of albumin in the urine, both dropsy and albumin soon disappearing. As she was convalescing, and while sitting in her chair conversing with me, she suddenly complained of giddiness and dimness of vision, which continued after she was assisted to lie down. In the following few days the vertigo slowly disappeared, but eyesight did not improve. Careful examination of the field of vision disclosed total blindness in the left half of each field, left homonymous hemianopsia. As the rays of light cross at the pupil, it is evident

that the right half of each eye is blind, and, owing to the arrangement and distribution of the fibres of the optic nerves the lesion must be on the right side, probably at the visual cortical centre in the occipital lobe near the calcarine fissure, or possibly between that point and the optic commissure. There was no other paralysis and no cerebral symptoms, other than those mentioned. The cause of the paralysis was either a hemorrhage or an embolism. The suddenness and completeness of the onset, the fact that there was no loss of consciousness or other pressure symptoms and the co-existence of heart disease favor the theory of embolism. The patient's general health remained good for one and a half years after the event mentioned, but vision did not show the slightest improvement. One week ago, in the night, she suffered an attack of paralysis of sudden origin and without loss of consciousness, which rendered her completely hemiplegic on the left side.

Case III. Miss C—, age 68, a sufferer from heart disease with cough and dyspnœa for several years. Physical signs—mitral regurgitation, with hypertrophy. Pulse very irregular. She was able to be around the house and do her work until she was taken with a severe pain in her abdomen. No fever, and not much tenderness were present, nor was there any explanation of the pain. She had been sick in bed for a few days, when, while sitting on the edge of the bed, she fell back completely hemiplegic. There was no facial palsy but speech was thick and difficult to understand. No loss of consciousness though senses were somewhat blunted, apparently, at first. Four or five days after the paralysis the palsied leg and foot were found discolored dark-red, except two palm-sized patches which were milk white. The gangrene progressed until in a

few days the patient died. The lesion in the brain, was I think, embolic, but I am wholly uncertain whether the gangrene was due to embolism or thrombosis.

I might cite still another case of senile heart disease in a man of 70, with well marked hypertrophy, but no valvular murmurs, with great dropsy, necessitating frequently repeated thoracentesis, but death took place from apoplexy at a time, when, so far as the heart was concerned, the patient was comparatively comfortable. In fact it has very seldom fallen to my lot to see patients die from heart disease *per se*. The great majority die from intercurrent disease or from complications in the nature of *sequelæ*.

The questions upon which hinge the treatment of heart disease are principally two: First, is the disease progressive? and second, is compensation adequate? The presence or absence of fever and active rheumatic processes will answer the first question; the second is settled by reference to the signs of impaired compensation, dyspnœa, cough, cyanosis and dropsy. Active endocarditis should be treated by rest, supportive, antirheumatic and symptomatic measures. Attacks of non-compensation with dropsy, must be met by digitalis, diuretics and purgation, but I must confess to being often disappointed in digitalis, in this as well as in other diseases. Diuretics are often futile. My reliance is generally on purgatives and my choice is elaterium, which conservatively given, is safe, efficient, painless, non-depressing and well borne by the stomach.

It might seem that the treatment of an incurable disease, with its liabilities to sudden, grave and distressing complications, must be a thankless and irksome task, yet I have derived much satisfaction in treating heart cases, for I know that life is

often prolonged and made tolerable, and when the inevitable end comes, it is often painless and easy. One of the pleasantest recollections of my early practice, is connected with a case of heart disease in a noble women of 73, whom judicious treatment repeatedly relieved from the most distressing attacks of dyspnœa and dropsy, and she died at last without dropsy and without pain, from simple asthenia. To fully restore to health is indeed a joyful task, but, when that is impossible, to smooth the declivities and rough places of life's declining path until it ends in euthanasia is one of the highest privileges of our noble profession.

THE INDISCRIMINATE USE OF MODERN ANTIPYRETICS.

BY F. D. ROBERTSON, ST. ALBANS.

Mr. President and Gentlemen:

The subject I have chosen for the paper which I now have the honor to read to you is "The Indiscriminate Use of Modern Antipyretics." In other words, gentlemen, do we not give the modern antipyretics far too often, and very frequently to the detriment of our patients?

Let me preface my remarks by saying, that, when I speak of antipyretics, (except in the instances where I specially allude to others) I mean always the coal tar derivatives, antipyrin, phenacetin, acetanilid and the like.

For some time past, during odd spare moments, and while driving about, I have been revolving in my mind, whether or no the treatment of the different febrile conditions which we have to contend with, was not often fallacious and far from being in the best interests of our patients. Some experiences of my own with the modern antipyretics being rather unfortunate, as well as cases which I have seen with other physicians, have led me to believe that the remedies above referred to were in many respects dangerous. These thoughts I have en-

deavored to formulate and put on paper, as much for my own instruction as for the purpose of exciting discussion on what to me is an extremely important question.

To take up the subject intelligently then, "The Indiscriminate use of Modern Antipyretics," it will be necessary, I think, to go into the subject of pyrexia and spend a few minutes with our temperatures more or less in the neighborhood of 103 or 104 Fahr. Let us begin by asking, what is fever? What is it as understood by the pathologist? What do modern clinical teachers think of it? And lastly, let us spare a moment or two and give our experience with fever, at the bedside, as country practitioners.

What then is fever? It may perhaps be defined as "A symptom of disease, the morbid process being manifested by increased heat of the body." Thus it is a symptom only, and not, as many of us are too apt to regard it, the disease itself. The cause of febrile disturbances is in the main attributed to entrance of poisons into the human body. The larger number of modern observers attribute, in the great majority of cases, pyrexia to the presence of bacteria into the blood, or the toxic material produced by bacteria, such as, ptomaines, and perhaps other alkaloidal poisons. Whether the bacteria themselves are the direct cause of the abnormal heat, or whether their presence in the blood develops some toxic substance, some poisonous alkaloidal principle which alone is the cause of the fever, I believe has not yet been definitely ascertained. It is supposed, and approved by Wood and others, that there is a heat centre in the pores, which may be a muscular vaso motor centre, or an inhabiting heat centre, which acts by

repressing the chemical changes in the constituents of the body through which heat is produced.

Such then, in brief, are the views of the modern pathologists. They hold that febrile disturbances are in the main caused by toxic substances, mostly bacteria, which gain entrance into the blood and cause such disturbance as to influence the heat center in such a way, as either to produce more heat than is natural, or to repress and keep in the body, part of the body heat, which should naturally and in health be radiated.

The clinical physician of the day, acting on this theory as a basis, is inclined to have a more friendly feeling towards the pyrexial condition than was formerly held by his confreres of some years ago, and he feels that the high temperature, which many of us are apt to dread, is after all, only for the best, and is nature's way of destroying the specific organism, or toxin, which has gained access into the fluid of the body.

These are the views that are held by cliniciens up to a certain point, and that point is hyperpyrexia, and, in such a condition, the best men prefer cold to the exhibition of large doses of antipyretics. Thus, in all ordinarily severe pyrexial conditions, he is apt to treat a few urgent symptoms, not being as eager to battle with the temperature, as he was a few years ago, for he reasons that in order to combat disease successfully, that is, if he wishes to shorten it he must find a specific, some medicine which will remove or destroy the cause of the morbid process or fever. Now if he cannot do that, the next best thing would be to exhibit some remedy that will ameliorate the pyrexia, and in this or other ways, so modify the disease as to render it less destructive to the different tissues of the human body.

He well knows that in most instances he is without the specifics, and also that in the majority of cases he cannot meet the latter indication by giving any of the coal tar derivatives. A few years ago, some German chemists discovered that certain derivatives of coal tar, such as antipyrin, kairine, acetanilid, phenacetin and the like, produced a powerful impression on the dissipation of heat during fever, and that by giving more or less large doses of these drugs, high temperature could be lowered and thus the worst symptoms, such as thirst, headache, muscular pains and the like, would be bettered. But it has been found also, by very dear taught experience, that these effects are transient and that, soon after the with-holding of the drug, the last state was worse than the first.

Now it is this very fact that these drugs do produce a distinct amelioration of the worst symptoms, that cause them to be the popular remedies that they are with us to-day. It is a well-known fact, gentlemen, that the whole lot of modern antipyretics taken as a block are serious heart depressants, that they weaken the heart's action to a dangerous degree, causing copious sweating and greatly weakening the patient, a thing which is most dangerous in such diseases as pneumonia, typhoid fever, septicæmia, or the specific diseases of childhood; and yet we only too frequently give them, and sometimes in conjunction with aconite or other heart depressant.

To quote Roberts-Bartholow, "Antipyrin diffuses itself into the blood rapidly and when given in sufficient amount brings about important changes in its constitution; the corpuscles are altered in form, the hematin separated, and the whole mass of the blood assumes a chocolate color."

The same author says of phenacetin, "The action that confers on phenacetin its antipyretic power, is the change in the composition of the red blood cells, whereby the oxidizing effect carried on by these bodies is lessened or arrested."

Should we, gentlemen, in such diseases as pneumonia or typhoid fever, both exhaustive to the circulatory and nervous system, administer drugs which lessen the oxidizing power of the blood? To again quote Bartholow, "Acetanilid," he says "modifies that function known as the oxidizing function and impairs constructive tissue metamorphosis."

Are we not playing with edged tools? Are not these most powerful drugs often productive of great harm to the patient? You all know the fable of the bear and the man; how the man fell asleep under a tree and his constant friend the bear, kept guard over his slumbers, and how one nasty little fly, despite the best efforts of bruin, would persist in annoying his master; how bruin at last getting angry, seized a huge stone and hurled it at the fly, which had lit on the forehead of his master, with the result, of course, of killing the man as well as the fly.

Do not antipyretics frequently act in much the same way on fever, as did the stone hurled by bruin at the fly, on the sleeping man. The fly was very aggravating, so is fever. The fly was killed with the stone, so was the man. I think we often reduce temperature by antipyretics and quite often the patient.

Now it is my opinion, in view of the fact that our patients now-a-days so frequently die of so-called heart failure, that at least, we should never exhibit any of the coal tar derivatives with aconite. Is there a man here who has not, at some time

in his practice, seen, after the exhibition of a large dose, say of acetanilid, the fingers get blue, the face look pinched, the lips livid and the cutaneous surface cold? I have, and I can truthfully say that my patient was not at all benefited, but rather injured by the treatment. I have yet to see one single case of any serious febrile disorder which has been benefited by the modern antipyretics. It is true that my patients have often been relieved of some distressing symptoms, but the disease has not been shortened, perhaps often the reverse, and they have very generally been left in a much more weakened condition than the seriousness or length of the malady would lead us to expect.

I have made a rule within the last few years, never to give antipyrin, or like antipyretics, without exhibiting with it some alcoholic stimulant and ordering it to be repeated in a short time. To this some may add digitalis as an additional guard. But all this, while it is for the best, is merely a confession of weakness. Do we not too often at the beginning of some serious febrile disturbance, such as pneumonia, typhoid or the like, while the disease is morbid, the diagnosis in doubt, all the symptoms not having shown themselves, give large doses of acetanilid and at the very outset so reduce and weaken our patient as to render a favorable outcome less probable? These I think are pertinent questions.

The coal tar derivatives never cure or shorten any of the specific diseases, but always weaken and exhaust. We may not notice this at the beginning of the malady but are often surprised at the sudden ending. Ought we not rather to conserve our forces so that our patient may have the needed strength to battle with disease when the hour comes? Some

men will say, why, we lower the temperature which is burning the patient up. Yes, but we lower the strength and vitality with it, and the toxin, or cause of the malady, still remains in the system uninfluenced in any way by the remedy. Some day chemistry or botany may point out specific remedies for all diseases, remedies which, like quinine in malaria, or salicin in rheumatism, are true specifics, but the coal tar derivatives are in no way on a par with these. That in certain cases of hyperpyrexia some authorities advise their use, I cannot deny, but the same always affirm that cold properly used is a far better remedy.

I remember very well watching a series of cases of typhoid fever in two wards of the Montreal General Hospital. One ward was under the care of the late Dr. Geo. Ross, the other ward was Dr. Walson's. The latter gentleman was administering to his patients antipyretics. Dr. Ross used a placebo, or treated symptoms as they arose, and let the temperature take care of itself. Dr. Walson's cases, to whom was administered an antipyretic, were prolonged a week or ten days longer than were Dr. Ross's who took the placebo. Dr. Walson also had more relapses and his mortality was much higher. Thus while the temperature chart showed a markedly lower temperature, yet the patients were not benefited, but rather was the disease the more prolonged.

Personally, I admit, that I give these fascinating remedies too often, but I have formulated a short set of rules in regard to their use, which have been entirely the result of bed-side experience, and I try to follow them to the letter.

In the *first* place, I never give antipyretics without first giving a stimulant and repeating the same.

Second. I never give them if the patient has any form of heart disease or heart weakness.

Third. I never give them during the crisis or lysis of any serious febrile disorder, or after the disease has exhausted the patient.

Fourth. I never give them in pneumonia, for, of all diseases, it is the most likely to end in heart failure, which may be accelerated by the exhibition of antipyretics.

Fifth. I never give antipyretics to the aged.

Sixth. Be careful how you give them to children.

Seventh. Examine the heart in every case before giving a large dose.

SURGICAL TREATMENT OF UTERINE NEOPLASMS.

BY J. C. IRISH, M. D., LOWELL, MASS.

Passing hastily in review the progress that has been made in the radical treatment of uterine tumors, both benign and malignant, we find ourselves recalling the history of abdominal surgery mainly for the last decade. It is true that before this time a few abdominal surgeons would now and then remove an immense uterine myoma in some desperate case in which there was no alternative. The fatality of these operations was necessarily great; they were done in too advanced a stage of the disease, when time had surrounded the growth with every possible complication. They were also efforts in establishing an operation that will always be formidable and often difficult to do. Therefore, at that time, ten years ago, with a fatality approaching fifty per cent. hysterectomy received very little favor or encouragement from the profession at large. But since this pre-historic period of the operation, if I may so call it, abdominal hysterectomy has been applied to a larger range of cases of uterine fibroids and has been done earlier. The technique of the operation also has been constantly improved. For these reasons the marvelous result was attained of reducing the necessary fatality of supravaginal hysterectomy in six years or up to 1890, from fifty to ten per cent. While the radical treatment of benign uterine neoplasms was thus rapidly ad-

vancing, and replacing varied and useless palliative measures, another method of removing the uterus, directed to the cure of cancer at the neck, was added Vaginal Hysterectomy. Vaginal hysterectomy in comparison with the supravaginal encountered at first, very little opposition. In fact, as soon as experience and practice in removing the uterus by the vagina had cleared away the many difficulties that beset the early operations, and perfected a technique at once uniform and practicable, the operation was welcomed as one of great promise, which it has since partially fulfilled. Vaginal hysterectomy, that has done so much already, and in the future will do so much more in saving women from an absolutely fatal disease, had also, to a certain extent, its period of failure and disaster. The reason for this is at once apparent. The only surgical treatment of cancer in this locality, that had before been attempted, was amputation of the cervix more or less high, which had been so dismal a failure that the new operation was eagerly welcomed by both surgeon and patient. Consequently most cases of cancer of the cervix that came along were operated upon without much regard as to the extent of the disease. Really, the many disasters and the very considerable fatality of these first hysterectomies were mainly due, not so much to a technique not yet perfected, as to the fact that in many cases the disease had involved surrounding structures or was complicated by tumors of the body of the uterus or ovaries. But as experience has gradually taught us to avoid operation as hopeless in cases of advanced disease, where the vagina and broad ligaments are involved, and to substitute another operation where other complications exist, the immediate death rate of the operation has descended to probably less than five per cent.

Thus one of the two surgical resources at our command for the treatment of malignant neoplasms at the neck of the uterus is being constantly more and more restricted in its application, while in sharp contrast our operation for the treatment of benign neoplasms, namely, supravaginal hysterectomy is being resorted to in a constantly enlarging class of cases.

Following still farther the history of our progress in the surgical treatment of these growths of the uterus, we have next to mention, not an operation, but an appliance, and that is the Trendelenburg table. This came into general use only about two years ago, and its introduction marks an epoch of progress in abdominal surgery, more important possibly than any single operation that has recently been devised. At first thought it would hardly seem that the position of the patient, on whom we were operating, would be a matter of very vital consequence; one would think that we could almost as well remove these tumors in the pelvis in a horizontal position as in the inclined one of the Trendelenburg posture.

But as a matter of fact, with a fairly long abdominal incision, which can be extended to the pubis, because the bladder recedes from the anterior surface of the abdomen, and with a broad retractor separating widely the recti muscles and with the intestines out of the way in the large abdominal cavity, the entire contents of the pelvis are within our view and reach. Dr. Sutton says: "Two years of experience with this posture have taught me that there is scarcely a limit to the possibilities of intra pelvic surgery." And this is absolutely true of that form of pelvic surgery that comes within the limits of our present subject. The great operation of complete abdominal hysterectomy is indebted practically for its existence and en-

tirely for its usefulness to this posture. This is our only resource, in dealing with malignant neoplasms of the uterine body, as well as certain forms of benign tumors which remain to be considered.

The general impression prevails that cancer of the body of the uterus is an extremely rare disease. My own experience, however, for the past three or four years, leads me to an entirely different conclusion. While not as common as cancer of the cervix or breast, still I believe that it occurs as frequently as does cancer of the pylorus or omentum. I have seen within the last year, at least six examples. This error has arisen, doubtless, from the great difficulties of diagnosis that necessarily attend the inaccessible position of the neoplasm. Cancer of the endometrium, however, is easily diagnosed, and is not a rare affection. The patient first suffers from hemorrhage. By dilatation and curetting we bring from the uterus granular masses whose malignant or benign character the microscopist can readily determine. Therefore in one form of malignant disease of the uterine body we can readily make our diagnosis and act with that promptitude that is always so essential in these cases.

The diagnosis of cancer involving the general structure of the uterine body can be discussed more properly in connection with the consideration of myomata.

Now summarizing the surgical means at our command for the treatment of malignant neoplasms of the uterus, whether the neck or body, or both, we are confined simply to two great operations: vaginal, or complete abdominal hysterectomy. You will all agree with me, I think, that any surgical procedure short of the two radical ones I have proposed, is per-

fectly useless, and that every cancer of the uterus should be removed when it can be done. We have left to consider, therefore, under this branch of my subject simply the following questions: In what cases we should attempt the operation; what results, both immediate and remote, we may hope to obtain; and in what circumstances the one or the other operation is indicated.

Whenever the disease is entirely confined to the uterus the latter can always be removed. Sometimes with cancer at the os it is impossible to determine before operation whether the infection has extended to the lower portion of the broad ligaments. Under these circumstances vaginal hysterectomy becomes difficult and dangerous on account of the ureters, and occasionally impossible. When the anterior vagina is even slightly involved the operation again is difficult and invasion of the bladder is extremely probable if we remove the entire disease. A more extensive infection of the posterior portion of the vagina does not positively contra indicate the operation, but again the proximity of the rectum is at best a very disturbing condition. But in all these cases of cancer at the mouth, the fact that the vagina or broad ligaments have become secondarily infiltrated, is an unerring indication of either long existence of the disease, or of a very great malignancy. It shows, too, that the local disease has gone a long way towards a general constitutional infection. The after history of cases of this kind that have been operated upon, abundantly sustains this view. They furnished the principal examples that were formerly so frequently quoted to the discredit of the operation.

In these instances even if vaginal hysterectomy has been performed successfully and without accident, recurrence of the

disease is so rapid, as a rule, that we do our patient very little good. Therefore I would restrict vaginal hysterectomy entirely to those examples of cancer where the neck alone is involved, and where the operation can be done very early in course of the disease.

I am well aware that I have laid down an arbitrary rule and that there are several instances in which vaginal hysterectomy has been done, where the disease has extended much beyond the limits I have indicated, with the permanent cure of the patient. But on the other hand for every one of these examples there are ten where the restrictions have been disregarded to the harm of the patient and the discredit of the operation.

In cancer of the body of the uterus, we have one single resource,—complete abdominal hysterectomy. What are its indications and limitations?

In malignant disease of the endometrium, the diagnosis having been established in the manner already suggested, the indication for hysterectomy is unquestionable, and is followed by permanent cure in a majority of cases. When there is a malignant growth confined to the body of the uterus, and also other tumors under the broad ligament or in the ovary, the mass of them being fairly movable, the operation, or at least an exploratory incision should be made. Any one of the following conditions seems to me a sufficient contra indication to any attempt at removal:

A marked decline of the general health, with great deterioration not due to hemorrhage; enlarged glands in the groin, or an immovable cancerous mass nearly or quite filling the pelvis.

I fully realize that there is much of detail and precision lacking in these directions, if we were to rely upon them entirely for the separation of the operable from the non-operable cases. Again the many and varying conditions outside of all rules, that individual patients will present, will give us many instances of doubt as to whether an operation is advisable or not. Under these circumstances an exploratory incision,—a procedure of slight danger, with the hope that it may end in a complete operation—should be made.

We have now to consider the results we may claim for our two operations,—vaginal and abdominal hysterectomy. Statistics furnish us only an approximate means of estimating the present death rate of vaginal hysterectomy, for if we were to rely upon the reports of different operators of their cases, the aggregate would certainly give a higher percentage of fatality than actually belongs to the operation, because these various lists contain the earlier work of the different men.

Bolt, reports forty-four cases of vaginal hysterectomy with an immediate mortality of 6.81 per cent. He reports, however, in 1892, twelve cases with no death.

Price, of Philadelphia, reports his mortality as below five per cent.

Montgomery, reports twenty-four cases with one death.

Byford, thirty-seven cases with one death.

My personal experience is comparatively small and recent; much too small to be of value, statistically in estimating the death rate of the operation. I have done vaginal hysterectomy eighteen times with no immediate fatality. One patient, however, died six weeks after the operation and probably in consequence of it. There was left a fistulous opening into both

bladder and rectum, and death was from exhaustion. The loss of this case therefore, although occurring after six weeks, was fairly chargeable to the operation.

My cases of vaginal hysterectomy, aside from their small number, are at fault for the purposes of this discussion because eight of them were done, not for cancer, but for complete prolapse.

Of our other operation, complete abdominal hysterectomy, the precise results can only be approximately estimated. You will recall that this operation is absolutely dependent for its existence upon the Trendelenburg posture, and that the latter has been in general use for only about two years. Therefore complete abdominal hysterectomy has been done only a comparatively few times. We are therefore still unable to speak with precision as to its direct mortality, but from what has been done, we may safely say that it is about as successful as vaginal hysterectomy; that is, that the inevitable percentage of mortality is not more than ten per cent.

Hence, in the treatment of malignant neoplasms of the uterus, we have two operations of choice: One with an immediate fatality of five per cent. if my estimates be accepted, and the other a fatality of ten per cent. Each a means of treatment that abdominal surgery of the last ten years has put into our hands, and when we remember that so short a time ago, in the presence of uterine cancer, even in its commencement, we were completely helpless, we cannot yet fully realize the great promise of these additions to our surgical resources. The remote results of ablation of the cancerous uterus, in one way, at least, are very gratifying. No unpleasant sequelæ of

the operation are left. Our patients entirely recover and suffer no serious inconvenience from having submitted to the operation.

When we come to inquire into the question of the recurrence of the disease, we open up a sad chapter of surgical history. Taken as a whole the after history of vaginal hysterectomy would indicate fewer permanent cures and an earlier return of the disease than follows excision of the cancerous breast. This bad showing is not at all an inherent failure of the operation, but is due to the error of operating on many cases past all hope of surgical aid. Again, in many instances the operation is done for more advanced disease than is now the case in amputation of the breast.

Really, removal of the uterus for malignant neoplasms by either method that has been described, should give a better percentage of cures than operations for cancer in most other parts of the body. The uterus and its adnexæ are so much isolated from the rest of the organism, that malignant germs are disseminated slowly as a rule, and when we come to operate we can go very wide of the disease. It is simply a question of early operation. The specialist therefore appeals to the physician to aid him in securing for vaginal and abdominal hysterectomy the fullest measure of success of which they are capable.

If I may be permitted to step aside from my subject one moment, I will make two suggestions as to diagnosis. However trite they may seem, they are still very important. Whenever there is found at the os an ulcer or a hard irregular nodule, a section should be immediately sent to the microscopist. When a patient in middle life suffers from menorrhagia

or especially from mettrorhagia, investigate the cause at once. This symptom always indicates a departure of the uterus from a normal condition and frequently the advent of malignancy. Unfortunately many women are living in a "fool's paradise"in the belief that this hemorrhage is a natural attendant of the approaching menopause.

The choice between vaginal and abdominal hysterectomy for removal of cancer at the mouth of the uterus will be largely a matter of preference with different operators. In the hands of one man the former operation will give the better results. While to one who has had much experience in abdominal work, the latter operation will be more satisfactory. For myself, in all cases where the vagina is narrow, or the uterus high up in the pelvis and not very movable, or where there is any suspicion of involvement of the broad ligaments, or other complications, I prefer the abdominal operation. I simply reserve vaginal hysterectomy for those cases in which the vagina is very roomy and where the uterus can be brought well down to the vulva. During the past six months I have done complete abdominal hysterectomy four times for cancer at the mouth, and vagina hysterectomy three times. The abdominal operations were not so difficult for me as the vaginal were. The convalescence of the four patients in which the abdominal operation was done was more rapid and uncomplicated than is usually the case in removal of the uterus by the vagina.

This paper has already occupied so much of the time which the courtesy of this society can give to it, that the discussion of the treatment of benign neoplasms must be very brief and imperfect.

At this moment, using the words of Dr. Bolt, the treatment of uterine myomata is in an experimental stage, and this utterance is truer to-day than it would have been three or four years ago, for our resources then, consisted practically of a multitude of palliative and semi-surgical procedures, and the one radical operation, supravaginal hysterectomy. We have discarded some of our palliative measures and are employing the others much less than formerly. On the other hand we still have our first operation supravaginal hysterectomy with the pedicle fastened in the lower part of the wound, extra peritoneally, and several other operations that have been recently introduced, or rather perhaps, speaking more correctly, modifications of the old supravaginal operation.

These new procedures that are on trial may most conveniently be classed as one new operation, complete abdominal hysterectomy, and the others as modifications of this.

First, Fixation of the pedicle below the abdominal wound, but still outside the peritoneum. (Kelley 14.)

Second, Byford's method of making an incision through the vagina in front, beneath the bladder, and turning the pedicle down through that incision.

Baer's method, or rather the one with which Dr. Baer's name is especially identified, ligating the broad ligaments and uterine arteries, and leaving the pedicle within the abdomen without any constriction. He depends of course upon ligature of the uterine arteries to sufficiently control all hemorrhage.

I simply refer to these several modifications, because so far, in the skillful hands of their advocates they have already given excellent results. They also obviate two great defects of the

extra peritoneal treatment of the pedicle, namely; the long convalescence and the danger of subsequent hernia.

Some one of them indeed, may, in the future, become the operation that will entirely supersede the old one. For myself I prefer complete abdominal hysterectomy, rather than any of these modified operations I have mentioned. I have had considerable experience with the latter and the results have been so satisfactory, and the technique has seemed to me so simple in comparison with the procedures mentioned, that I shall continue to substitute this operation in place of the original one under certain conditions. Therefore at this time, for the radical treatment of uterine fibroids, my own surgical resources consist of supravaginal hysterectomy with the pedicle outside, and complete abdominal hysterectomy.

Calling your attention for a moment to the palliative methods of treatment for uterine myomata, probably the most valuable is curettage for the relief of hemorrhage, a single one of the many evils that this neoplasm inflicts upon its possessor. This procedure fails in a majority of cases precisely as does electrolysis and for the same reason. Neither the sound attached to the battery, nor the curette in the surgeon's hands, can reach the whole diseased endometrium in the tortuous uterine canal. In every other respect, electricity, after a trial of seven years, has disappointed the great expectations of its advocates. The few who still use it are largely occupied in explaining the mischief it does.

Removal of tubes and ovaries as a treatment of fibroids I have now entirely discarded. The operation does not always arrest hemorrhage or stop the growth of these tumors, nor does it prevent the malignant degeneration to which they are liable.

While on the other hand, the operation is almost as difficult and dangerous as hysterectomy is, at the present time.

Dr. Martin of Chicago has recently introduced as a palliative operation, ligation of the uterine arteries through the vagina. The value of this operation is still for the future to determine. But in the future treatment of uterine neoplasms I believe that palliatives will have a small place. Palliative treatment belongs to incurable diseases.

The addition of complete abdominal hysterectomy renders the means at our command for the removal of uterine myomata well nigh perfect. Practically there are no longer any cases in which the operation is impossible. The future therefore, in this direction, has for us no advance except in details of operation. Abdominal hysterectomy is especially indicated in those cases of small fibroids extending under the broad ligaments or growing from the lower segment of the body of the uterus or neck, and packed deeply within the pelvis. It is precisely in this class of tumors that supravaginal hysterectomy has been very difficult to do and frequently impossible. This operation should be selected also in other instances in which from thickness of the abdominal walls or rigidity of the pelvic floor, it is difficult to bring the pedicle out at the lower angle of the wound. On the other hand in those instances of delayed operation, which let us hope will become rapidly less and less, where the patient's strength has been seriously exhausted by hemorrhage, the size and pressure of the tumor, or septic infection from a degenerating myoma supravaginal hysterectomy will be the operation of choice. Under these circumstances the length of time that the operation occupies is a very important factor in the result, and our old operation

can be done much more rapidly and easily than the new. In ordinary cases we may choose at will the one or the other. The advantage of supravaginal hysterectomy, is its great simplicity; the advantages of abdominal hysterectomy are the shorter convalescence and diminished danger of following hernia.

Finally, what are the indications for hysterectomy in the treatment of uterine myomata? Not long since, the existing or prospective large size of the tumor was the main indication for removal that was recognized. The logical deduction from the teaching, that these neoplasms were benign and always remained so, would be, that they could do no harm, except from their size or their direction of growth. The attendant accident of hemorrhage was simply a symptom to be treated by palliatives. But latterly more careful and long continued observation of the clinical histories of myomata in large numbers, have corrected many errors and given us new data from which to formulate our rules of treatment.

Only a very small proportion ever reach a size sufficient to make them dangerous to the life of the patient.

Secondly, we are not dealing with a self limited disease, limited by the menopause as has been so generally taught. On the contrary the approach of the climactric instead of affording relief to patients with myomata is really the most dangerous period in their lives. A record of ninety-four cases of uterine fibroids shows that forty-three of them developed dangerous and formidable symptoms in patients between the ages of forty-two and fifty.

But the greatest danger with which they are attended comes from their liability to various retrograde changes, among

which may be mentioned: Calcarious, necrotic, pus forming, cystic and malignant degenerations, the latter the most important because the most frequent and insidious of all. Of one hundred and ninety-six cases, in thirty-eight, Martin of Germany found changes in the tumor, which, he said certainly represented the opposite of that which could be called benign. Another danger comes from pus tubes and tumors of the ovary with which they are often attended. When these complications occur they are fully as dangerous as are pus tubes and ovarian cysts in other patients that have no fibroids.

From these few facts we may at once infer that any rule as to operation, based on the theory that we are dealing with benign and consequently harmless growths, can be nothing else than an incorrect and dangerous one. Again, small fibroids are quite as likely to become malignant as the large ones, and when they involve the body of the uterus, we can only make a probable diagnosis as to their malignancy. In fact it is impossible to determine with any precision whether these small outgrowths from the uterus were fibroid in the beginning, or cancerous; or whether or not, beginning as fibroids, they have degenerated into cancer. The clinical history and general aspect of the patient will afford us some diagnostic aid. If she is pale, cachetic, debilitated and progressively losing in strength and weight, malignancy of the tumor may certainly be suspected.

Still, other forms of degeneration often produce a similar train of symptoms. At any rate the indications for removal of the tumor are urgent, whatever its pathological character. Remove the growth first, and make the diagnosis afterwards. Whenever the general health of a patient by reason of a uterine

neoplasm descends greatly from the normal standard, she is ever afterwards an invalid until the abnormal growth is removed.

It is undoubtedly true that many myomata produce no symptoms. There are no means of knowing how frequent such cases are, but we may, however dismiss them as of little interest in the present connection, for there would be no question in such instances of an operation. But whenever a uterine myoma, large or small, begins to impair the general health or produces pain enough to seriously demand relief, I would advise hysterectomy as our only means of cure. The operation with its present death rate of ten per cent. is less fatal than the disease, while in nine cases out of ten, it brings perfect health in place of chronic and hopeless invalidism.

In short, with the exception above noted, I would apply to uterine fibroids the general surgical rule that Mr. Bland Sutton has well indicated in the following words: "It is a noteworthy fact that most pathologists, who have taken comprehensive views of tumor formation and have made it a serious and prolonged study, are of opinion that tumors, innocent and malignant, are in the beginning, local troubles, and that the safest and most effectual method of dealing with them may be expressed in one short sentence: Thorough removal of the tumor, whenever this is possible at the earliest possible moment."

DISCUSSION.

Dr. D. C. Hawley: *Mr. President and Gentlemen*: I feel personally to thank Dr. Irish for his very estimable paper and I am sure we will be agreed from our own reading, and from what Dr. Irish has said, that in the line of abdominal

surgery, great advances have been made within the last ten years, perhaps as great as in any other line of medicine or surgery.

I am sure that I can add nothing to what Dr. Irish has said, at the same time I feel that this valuable paper is worthy of a free discussion and I will just say a word in regard to the choice of an operation.

This lies between vaginal and abdominal hysterectomy and may be indicated along two lines which the Doctor has pointed out. In case of cancer of small size so that the tumor can be readily removed through the vagina, a few surgeons will still cling to this method of removal. In cases involving more of the uterine structures, and also in cases of fibro-myomata of considerable size, there is no choice save to accept an abdominal operation of some character. This operation in the hands of such men as Dr. Irish, and others, who make a specialty of this work, of course, is a simple operation. To us in the country where clinical material is not so extensive, it may seem a more formidable operation. At the same time it is one we should become more acquainted with, and in our hospitals, at Burlington, is being done to some extent.

In regard to the Trendelenburg position of which Dr. Irish has spoken: This consists, as you are all aware, of putting the patient in a position with the hips and legs elevated on a table made for the purpose. The intestines are out of the way of the operator, and what was done formerly by the sense of feeling is now done where you can plainly see your work.

One word in regard to the abdominal incision. In this and in all the cases in which I have had experience, it is far better to make an incision through which you can work con-

veniently and well and lose no time rather than to make an incision a couple of inches long. I believe that the amount of time you may save, the fact that you keep your patient under the influence of ether for a shorter period of time is more important than confining the incision to a length of two or three inches. I prefer an incision through which I can work easily, one of three or four inches.

I do not know as I can add anything further and I will leave the subject for some one else.

DR. E. M. POND: *Mr. President and Gentlemen*: In performing these operations or in following them, it has been perfectly surprising to me to see the rapid convalescence. (Cites case.) The patient was put in the Trendelenburg position, the incision made, and the tumor and about a quart of pus removed. The peritoneum did not become affected and in two weeks after the patient was up and around. The highest temperature was about one hundred.

The posture certainly facilitates the technique of the surgeon. The intestines are entirely out of the way, you can see the entire pelvis, and when the operation is completed, see the peritoneum thoroughly closed over.

It is surprising to see how quickly these operations can be accomplished. The special case which I spoke of, lasted only fifteen minutes, and I have seen large fibroid tumors, larger than the head, removed in a comparatively short space of time.

DR. J. B. WHEELER: *Mr. President and Gentlemen:*

I feel as though I ought to offer my personal thanks, as well as the thanks of the society, to Dr. Irish for coming up here to give us so interesting and instructive a paper.

There are a great many points in it which I should like to say something about, but the time is short and I will speak of two or three, and perhaps will mention a matter that has come up as much in the discussion as in the paper itself.

In regard to the Trendelenburg posture, I would say that anyone who has used that posture at all must be convinced of the immense advantage it affords for working within the pelvis.

We might get the impression that it was necessary in using this posture to have a table or something constructed specially for that purpose. Of course it is more convenient, but like many other things, we can get along without it when we have to. In any house in the country you can usually find a narrow table, or if not, then lay a plank across a flour barrel, and then take a chair that has not got arms and put it like that, (indicating.) Then nail a board across here and lay a pillow across there so the patient would not be cut as the knees come over the edge of the board, and you have got a good operating table. Of course it is not quite as convenient as an apparatus that you can raise by screws and ratchets and things, but it is a good deal easier to extemporize than to do without.

I was glad to hear Dr. Irish speak of the danger to which women with fibroids are exposed. I hear it said so often when I see such a case, "well, if she can stand it for a few years longer she will come to the change of life and get along all right," and "do not subject her to an operation." There is danger, as Dr. Irish has said, of malignant degeneration at the time of menopause, to say nothing of the constant drain on the patient's system, and the discomfort and inconvenience of carrying the tumor around, and in advising such a

course I do not think most of us are sufficiently alive to the difference between the present mortality rate of hysterectomy, and that of a few years ago. Ten years ago, I think the Doctor said, that the mortality was fifty per cent. and that is the impression that most of us I think, carry in our minds—that it is a very dangerous and almost necessarily fatal operation,—the removal of the uterus. Well, the changes in technique, and in selection of cases too, probably, have been so great in that time that we have now got down to a mortality of ten per cent. and in all probability we shall get lower than that as technique goes on improving. Now it seems to me that under these circumstances there should not be much hesitancy in deciding for a person who is able to stand any operation, in favor of an operation. I think we want to realize thoroughly the fact that the operation of hysterectomy is not the deadly business that it used to be.

Dr. O. B. Douglass, (New York); *Mr. President and Gentlemen*: I am very happy to be here. I love to meet the representative men of Vermont, that I am sure to do in attending these meetings, and it gives me great pleasure to be here. I always carry away a good taste, as I may call it, when I go away from here.

In the papers presented and in the discussion of them, much does not come within the range of my special work and although everything relating to surgery and medicine is interesting to me, I am not so well posted, but am happy to learn so much about this operation last mentioned. This summer I was consulted by a woman suffering with a tumor in the uterus, and I told her she had better wait a little while and probably would get very much better. I did not advise an operation. I am sorry now that I did not.

A RETROSPECT IN THE STUDY OF URIC ACID.

BY GEO. B. NICHOLS, M. D., BARRE.

It would seem almost preposterous, after 20 years study in the germ theory of disease to step in with a new line of causes and assert that they are as influential in the production of a large line of diseases as the microbe and bacillus. Yet I think it to be a fact, and I attribute this line of causes to poisons generated within the system from non-elimination of waste products and improper metabolism of the foods taken within the system.

Some three years ago, after having suffered from sick headaches for more than a dozen years, I observed an article in Wm. Wood's series of Monograms on Uric Acid as a factor in disease, by Prof. Haig, of London, which led me to a closer study of that subject. Following his instructions and taking hints here and there, I have been able to corroborate a great many of his results and thus make more progress in the study than if I had been left alone to evolve theories and clinical facts.

Deeming this a very important subject to every physician, I desire to take a portion of your time, to-day, in presenting to you some of the most important points as relates to the effects of uric acid on the general health.

There is no part of the human system that has received so little attention by the common practitioner, as the workings of the kidneys, both in health and disease. The difficulty of a satisfactory study of the results of the operations of the kidneys seems to be in the fact, that there are no processes in chemistry that are simple enough for the ordinary physician to test the urine for the by-products beyond those of urea, albumen, and sugar, hence, this line of study is relegated to chemists alone. But few chemists are able to make proper application of the chemical results so as to be of any importance to the general physician. For these reasons this line of study has not been developed, and the physician is groping in the dark for the cause of many diseases and the line of treatment that will be most efficient.

It is not my purpose, to-day, to enter into the details of examination of urine, but to enter at once upon the results and observations gained in this study.

The atomic parts of uric acid are, $C^5\ H^4\ N^4\ O^3$, while urea is composed of $C\ H^4\ N^2\ O$, showing that uric acid is a product of less oxidation than that of urea. In other words, if we take a molecule of proteid matter with the formula of $C^{72}\ H^{112}\ N^{18}\ O^{22}\ S$, add to it 139 atoms of oxygen we will have urea, $4(C\ H^4\ N^2\ O,)$ uric acid, $C^5\ H^4\ N^4\ O^3$, creatinin, $2(C^4\ H^7\ N^3\ O,)$ $55\ C\ O^2$, $38\ H^2\ O$, $H^2\ S\ O^4$, as a normal product of the kidneys, but if we take only 136 atoms of oxygen, we will have only urea, $2\ (C\ H^4\ N^2\ O,)$ but uric acid, $2(C^5\ H^4\ N^4\ O^3)$ and creatinin, $2\ (C^4\ H^7\ N^3\ O,)$ $52\ C\ O^2$, $40\ H^2\ O\ H^2\ S\ O^4$. If we take only 129 atoms of oxygen, we will have one molecule of oxalic acid; if we reduce the amount of oxygen to 76 atoms we shall get 5 molecules of glucose. Thus the

lower the state of oxidation, the lower the by-products and the comparative condition of the human economy. By a careful examination of the urine we are able to determine the metabolism that is taking place in the system and discover many of the causes of disease.

The causes of deficient oxidation and the unnatural by-products in the blood and urine are numerous,—as poor air, too little exercise, a sedentary life, too much carbo-hydrate food compared to the nitrogenized foods, as all such articles of food that contain starch and sugar, for they are more easily oxidized than nitrogenized food, so that the nitrogenized food remains in the system unoxygenized and passes out of the system as a by-product. Over-loading the stomach and liver as well as too much elimination of waste material, as in fevers and other wasting diseases, all have a tendency to produce more or less uric acid and other by-products.

We have seen, when there is an excess of uric acid, there is a diminished amount of urea, and vice versa, this is true, both in the chemical and the physiological results of the action of the kidneys. Prof. Haig, maintains that when there is an excess of uric acid, there is a diminished amount of urine excreted and vice versa. He further maintains that the natural relation of urea to uric acid in the urine is as 33 to 1, and as this ratio is deviated from there will be a deviation in the general health and well being of the individual. As the ratio of uric acid increases there will be irritability, melancholia, headache, epilepsy, hysteria, etc., but when the amount of acid is diminished then we have a sense of well being, a clear mind, and cheerful spirits. With excess of uric acid we have a high tension of the artery with a diminished pulse rate, and as the

acid diminishes, the tension and pulse return to the normal condition.

The examination of the urine during convulsions reveals the fact that as the uric acid is increased, the more severe the convulsions, and as it is diminished the convulsions are reduced. So too in eclampsia. The pressure upon the abdominal organs interferes with the proper oxidation of the proteids and a surplus of uric acid is created, and as it passes through the system we get the nerve explosions which produces eclampsia. If the physician is on the guard and causes the uric acid to be eliminated from the system as fast as generated he will avoid the dreaded results. Roberts has pointed out that there are periods which he calls "tides" when the amount of uric acid is eliminated more freely than others. These "tides" he calls the "alkaline and acid tides," and has shown that as the alkaline prevails there will be a greater amount of uric acid in the urine, and during the acid tide there will be less amount of uric acid. This is fully corroborated by the examination of the urine. It has been found that the uric acid is only dissolved in an alkaline fluid, and precipitated in an acid medium. It will only be found in the blood when it is strongly alkaline, and when the alkalinity is diminished, then the amount of uric acid is diminished both in the blood and urine, it having been driven into the tissues, only to be re-dissolved and brought into the blood, when it is strongly alkaline.

When this acid is secreted in excess of the regular ratio, and is in the blood and urine, we find that it exerts an irritation on the nerve centers, and to the degree of this irritation will we find the nervous system affected producing irritability, melancholia, headache, epilepsy, hysteria, etc., and when the

amount is diminished in the blood and urine and driven into the tissues, such as the ligaments and joints where the blood circulates least freely, we get rheumatism, gout, and the like diseases. Thus we have only to drive the acid into the blood to get the headaches and nervous diseases, and into the tissues to get the rheumatic diseases, etc.

Prof. Hayem, has recorded cases where enteritis occurred, the villi being strewed with small uratic encrustations, and that severe colic, tympanitic distension, enteralgia, and diarrhœa are sometimes distinctly referable to gouty disorder. Urates of lead, zinc, mercury will produce enteralgia, etc., also cocaine and many of the cathartics. In lead colic we have high arterial tension and scanty urine.

So it has been found that certain drugs will drive the uric acid into the tissues, as lead, iron, opium, caffein, acids, etc., while alkalies, salicylic acid and others will bring it back into the blood and urine. It is found that salicylic acid works best when there is diminished alkalinity of the blood.

In inflammations, as pneumonia, peritonitis, etc., there is a diminished amount of uric acid in the urine and blood, but when resolution takes place, the urine becomes loaded with the acid.

Another important result of excess of uric acid in the blood is the destructive effect it has upon the blood corpuscles producing anæmia. The greater the over product of this acid in the blood the more pernicious the anæmia. Prof. Haig, by a long series of experiments has found that he can diminish the amount of red blood corpuscles at will by introducing into the system uric acid or articles which produce an excess of the

acid. By withholding all substances that produce this acid he finds that the blood corpuscles begin to increase, showing conclusively that this acid does materially effect the blood corpuscles.

Bright's Disease is largely due to the high tension of the arteries and the irritation produced by the presence of the excess of uric acid within the kidneys, causing a destruction of the epithelial cells of the tubules. And as the epithelial cells are destroyed, the kidneys fail to oxidize the proteid materials and we get still more uric acid and other by-products which are equally poisonous within the system.

In dropsy we find that as the ratio of the urea to uric acid, so is the amount of urine passed and the effusion of water diminished, and vice versa. To remove the anasarca we must reduce the amount of uric acid in the urine by such remedies and diet as will diminish the amount of uric acid and nitrogenous substances in the blood and the general circulation.

If the amount of nitrogen taken into the system be diminished or withheld there certainly cannot be as much urea and uric acid formed in the body. Again if the amount of carbo-hydrates taken into the system be large, than even a small amount of nitrogenous foods will remain in the system unoxidized and will pass out of the kidneys as some by-product.

For purposes of testing the effects of uric acid we have only to give a patient a large bowl of beef tea, and within 48 hours we find an excess of the acid in the blood and urine.

The effect of giving uric acid is to first render the blood less alkaline and produce an increase of urea, but as soon as

the alkaline tide returns then we will get an increase of the uric acid in the urine, which will generally be on the second and third days after taking the acid.

The effect of liquors are to render the blood less alkaline and thereby surcharge the tissues with uric acid to be returned to the blood a little later, and when greatly in excess to produce nerve disturbances even to delirium tremens.

If I shall succeed in getting some of you interested in the study of uric acid, and shall have thrown any light upon this subject I shall feel well repaid for my trouble.

HISTORY OF AN EPIDEMIC OF ACUTE ANTERIOR POLIOMYELITIS.

BY C. S. CAVERLY, M. D., RUTLAND.

During the month of June, 1894, there appeared in a portion of the valley of the Otter Creek, in the State of Vermont, an epidemic of nervous disease, in which the distinctive and most common symptom was paralysis. The great majority of the sufferers were children under six years of age. The city of Rutland and town of Wallingford were first affected, later the towns immediately contiguous to these, and to this tier of towns, thirteen in number, the outbreak was almost exclusively confined.

A remarkable series of cases occurring in the city of Rutland first attracted the attention of the physicians, and later, popular interest. Many of these cases were taken sick without apparent cause. In others it was ascribed to getting overheated, or chilled suddenly when heated, indigestion, and occasionally to trauma. After a few weeks deaths were heard of, and during the latter part of July everyone was discussing the "new disease."

From my own observation and conversation with other physicians, it was plain to me that an epidemic of unusual, if not of unique type was prevailing, and I decided that my connection with the State Board of Health imposed a duty upon

me in connection therewith. The investigation thus undertaken in an official capacity soon showed me that the information I was acquiring, while unusual and valuable from a public health standpoint, was doubly so from that of the practitioner. I am sure, therefore, that the physicians who have so kindly given me, as a member of the State Board of Health, the bulk of the data on which this paper is founded, will pardon the use to which I propose to put this material.

This epidemic has been confined, with very few exceptions, to the narrowest part of the Otter Creek Valley. The territory is bounded on the east by the Green Mountain Range, and on the west by the Taconic Range of mountains. North and south it has no natural boundaries. Its area is about fifteen miles wide, including the sides of the bounding mountains, and thirty miles long. The rock formation through this valley, as a whole, is limestone. This is especially true of the western side of the valley, and the Taconic hills, where the marble deposits of Vermont are chiefly found. I am informed by Prof. Geo. W. Perry, the State Geologist, that this valley, which was, at a remote time, a lake-basin, possesses no remarkable features from a geological standpoint, in fact, is quite an ordinary valley. Through this valley, from south to north, flows the sluggish stream of Otter Creek, dammed at several points. This stream, which has its source just south of Rutland County is fed by mountain brooks of very pure water from both sides of the valley. It receives no appreciable contamination above Rutland, where is poured into it all the sewerage of the city, and below this point it receives constant accessions of sewage. The extreme heat and drouth of the early summer had rendered the stream unusually low. The only reliable figures ob-

tainable as to temperature, humidity and rainfall for Vermont are furnished me by the United States Weather Bureau Observer at Northfield, Vt. Since the opening of the station at that place, in 1887, the average temperature, humidity and rainfall per month, for the months of April, May, June, July and August, the months in which these conditions could have any influence on an epidemic occurring during the summer months were as follows:

	Temperature.	Humidity.	Rainfall.
1887	57.7° F.	76.7	3.75
1888	55.3° F.	72.5	3.45
1889	57.6° F.	74.1	3.05
1890	55.3° F.	87.8	3.79
1891	56.2° F.	75.8	2.98
1892	56.9° F.	74.8	3.76
1893	56,5° F.	75.6	3.51
1894	56.1° F.	77.3	2.25

It will be noticed by these figures that the only marked deviation from the recorded meteorological conditions of the past eight years, which has occurred during the past summer, has been in the average monthly rainfall. This has been thirty per cent. less during the past spring and summer months than the average for the past eight years during these months. While it was a matter of frequent remark that our early summer was this year unusually hot, the official figures do not bear out this statement.

The population of the towns affected in this valley aggregates twenty-six thousand, of which eighteen thousand dwell in the quarrying and manufacturing centres of Rutland, West Rutland and Proctor. The usual sprinkling of foreign

elements prevails in these centres, while in the outlying farming towns the population is chiefly of the regular New England type.

The first cases in this epidemic of which I find notes, occurred in the city of Rutland and town of Wallingford, simultaneously, about June 17th. The characteristics of the disease can be illustrated by a few cases, among the one hundred and twenty-six of which I now have notes.

Case 1. Boy, three years of age, American. Previous health good; active child; healthier than his brother two years older. No apparent cause. Moderate fever; coated tongue; loss of appetite; sluggish bowels. As these symptoms improved, it was observed that he could not walk or even stand alone. Reflexes normal; sphincters normal; no hyperæsthesia. The weakness was most noticeable in the extensors of the thigh. After ten days he began to improve, and in three weeks was quite well.

This case is an illustration of the mildest type of these cases. Many of the cases classed below as "fully recovered" were of this type, and, as will be noticed, the great majority were paralyzed in the legs.

Case 2. Boy, three and a half years of age, Irish; sturdy child; apparent cause, playing too hard. Fever 102° to 103° F. Incontinence of urine for ten days; urine contained no albumen; hyperæsthesia. Fever abated on third day. Then was noticed paralysis of both legs; loss of patella reflex; no anæsthesia; slight response in lower extremities to faradism. Left leg improved rapidly, right slowly. After six weeks was able to stand and take a few steps by taking hold of chairs. Had a wobbling gait. After three months paraly-

sis confined to right glutei and lower spinal muscles, with considerable wasting. The weakness of spinal muscles has resulted in a spinal curvature.

Case 124 Dr. Cummings, Rutland. Boy, three years, Irish. Previous health good. Had a fall, striking on the hips in a sitting posture. For several days after this had a fever of about 102°. This was followed by paralysis of both arms and marked weakness of both legs. There is left paralysis of the arms, with wasting of the arm and shoulder muscles, also a weakness of the leg muscles.

Case 63. Dr. Moore, Shrewsbury. Girl, fifteen years. Previous health good; headache, temperature 104° F., pulse, 104; muscles of back and legs sore and weak. On fourth day all the extremities were paralyzed. Pulse and temperature normal on seventh day. Had retention of urine and obstinate constipation for several days. Paralysis most profound in lower extremities. Can only move toes slightly. The upper extremities improved rapidly and she soon recovered their use. The right leg improved faster than the left, and now, six weeks after the commencement of the attack, is quite well, but the left is still paralyzed.

Case 94. Practice of Dr. Rustedt, Rutland. Boy, six years. Healthy child. Apparent cause, chilling the body when heated. Fever and disturbance of digestive organs, attended with vomiting for six days. Temperature ran to 104° F. No convulsions, no special sense disturbance, no bladder or rectum symptoms. On the sixth day the right arm was paralyzed, and the following day the left leg was also paralyzed. The paralysis at first seemed to involve the whole of each limb. After three months the paralysis is confined to the ex-

tensors of the left thigh and to the right deltoid. These muscles are also somewhat wasted.

Case 126. Dr. Newell, Proctor. Boy, six years, American. Nervous child, but good general health. Exposure and cold. Head and earache, slight nausea, temperature, 101-103° F. Excitable but hardly delirious. On third day, subsidence of febrile symptoms, and left leg paralyzed. No bladder symptoms, no hyperæsthesia. Reflexes normal. Paralysis confined to extensors of thigh. No wasting. Began to improve after a week. Six weeks after, improving but cannot walk.

These five cases illustrate a very common phase of the disease. Some of the cases fully recovered, and many still suffer from probably permanent impairment of some muscles. They were of a distinctly severer type of disease than those illustrated by Case I.

Case 4. Practice of Dr. Fox, Rutland. Boy, six years. Previous health fair. Had, on two or three occasions convulsions, presumably due to some gastro-intestinal disturbance. Seized with convulsions while playing in the street. They continued nine hours. Moderate fever, rapid pulse, vomiting, rigidity of neck and back muscles. No paralysis noted during the time he was conscious. Great restlessness. Retention of urine during last three days, catheterized. Death on the sixth day.

Case 32. Dr. Marshall, Wallingford. Female, twenty-one years. Married, one child sixteen months old. Child had been sick and mother was fatigued from caring for it. Taken with head and backache, pulse, 80, temperature normal, third day, temperature, 103.5° F., pulse 100, eyeballs rolled up,

head drawn back, bowels regular, urine normal, no albumen, no sugar, red blotches on skin that came and went—urticaria. Temperature, 100.5-102° F., for succeeding three or four days, pulse about 100. Unable to swallow or speak. Conscious, answering questions by moving the head. No pain. Sixth day, pulse, 60, temperature, 98.6° F. Eleventh day, pain in stomach, neck rigid, pulse 100, temperature, 98.6°F. This continued during the next two days, then pulse sank to 45 and became irregular. Thirteenth day, pain in right side of head and right eye. Heart gradually gave out and died.

Case 93. Practice of Dr. Swift, Pittsford. Boy, two years, American. Was taken with an apparent attack of ordinary indigestion—vomiting and slight fever. On second day mother noticed he could not stand. Third day seemed much better, and was taken on a long carriage ride. Was at once taken much worse. Temperature, 104½° F., pulse, 130. Had slight convulsions, irregular pupils, head retracted, complete paralysis of both legs. These symptoms continued with slight improvement, four days. Then fever left him, tongue cleaned, and he retained nourishment; pulse, 90. Two days later without apparent cause, went into collapse, with pulse that could not be counted, axillary temperature, 96° F., cold extremities, mouth and tongue covered with sordes, throat seemingly paralyzed. Under stimulants slowly revived, and two days later was again in fair condition. Paralysis of both legs complete. Contraction of both Achilles tendons. In two weeks had regained his usual health except that his legs were completely paralyzed. After one month, seems as well as ever and can sit in a chair and use all the muscles except those of legs, which are useless.

Case 96. Dr. Swift, Pittsford. Boy, three and one-half years, Italian. Taken with headache, drowsiness, slow, hobbling pulse, 45 per minute, no temperature. This continued for four days, when he developed strabismus. On the seventh day was apparently as well as ever again. Three days later, after playing hard out of doors, had a recurrence of former symptoms,—headache, strabismus, drowsiness and slow pulse. These symptoms continued three days, when he had a convulsion followed by coma and death.

Case 125. Dr. Strobell, Rutland. Female, aged twenty-nine, American. Married; one child aged eight months. Does not nurse child. Neurasthenic; no apparent cause. No fever; much nausea; great head and backache; marked opisthotonos; double vision; deafness for several days and roaring in head. Retention of urine; catheterized eight days. Soreness of legs and arms; no eruption; pupils fully dilated; second day, paralysis of right arm; fourth day, right leg; fifth day, left leg; and sixth day, left arm; also paralysis of abdominal muscles and obstinate constipation; anæsthesia of limbs; reflexes gone. After three weeks has recovered slowly use of limbs except leg muscles, which she is still unable to use.

Case 88. Dr. Gale, Rutland. Female, aged six, American. Frail child, had a spinal curvature for four or five years. No history except this. Fever; nausea; head drawn to one side; facial paralysis. On third day paralysis in all extremities; hyperæsthesia; soreness of joints; obstinate constipation from inability to use abdominal muscles. After two months, paralysis continues, except slight movements of toes and fingers; considerable wasting. Bodily functions fair; mind and special senses normal. Facial paralysis passed.

These six cases illustrate the severer cases of the epidemic, many of which were fatal. There were a certain number of cases exhibiting odd and interesting symptoms out of the usual line.

Case 11. Dr. Crain, Rutland. Boy, seven years, American. Was having whooping-cough and developed a broncho-pneumonia. During the progress of the latter disease had loss of speech which lasted two weeks; delirium; fever, for seven days. On the seventh day had paralysis of left arm, involving the whole arm. In two weeks from this time had recovered the use of the arm except the deltoid muscle. After four or five weeks fully recovered.

Case 87. Dr. Gale, Rutland. Boy, aged four, American. Convulsions; double vision for one week; very drowsy; moderate fever; no other positive constitutional symptoms. Paralysis of external rectus of one eye, which remains.

Case 99. Dr. Brigham, Rutland. Boy, aged thirteen, French. Had a fall injuring back, followed by fever, nausea, muscular rigidity of neck. From this, case ran along like an average case of typhoid fever, lacking marked typhoid symptoms except the fever curve. Fever lasted four weeks. Following this was paralysis of right arm and right leg. Paralysis improving.

Of the 126 cases of which I have notes, all except six were in the valley above described. Of these six, two occurred in the town of Ludlow, on the east side of the Green Mountains, and three in Middletown, and one in Fair Haven, in Rutland County. The epidemic died out first in the towns

first affected, and lingered latest in those affected last.* Of the thirteen towns in the Otter Creek Valley which have suffered from this epidemic, those that show the greatest number of cases: Rutland, fifty-five; Proctor, twenty-six; and Pittsford eight, are immediately on this stream. The towns of Wallingford and Clarendon, also on the stream, suffered very little.

As before remarked, the Otter Creek is a comparatively pure stream above Rutland, while below it carries considerable sewerage. There is very little likelihood, however, that there was any connection between the contamination of the stream and the greater prevalence of the disease at and below Rutland, for the disease showed no preference for houses directly on the stream, on the contrary, these houses were notably exempt just below Rutland, where the greatest pollution of the water exists.

Slight elevations and the upland settlements seemed to feel the force of the epidemic most, though cases occurred at high elevations on both sides of the valley.

The water supply of these towns is wells in the rural settlements and mountain springs and streams in the larger communities, having public supplies.

It should be stated that there have been, among domestic animals in this valley, many cases of paralytic disease during the period of this outbreak. Horses, dogs and hens have died, paralyzed in their extremities. Beside the hen examined by Dr. Dana, to which reference will presently be made, I am

*New cases, three in number, are reported from Proctor, Pittsford and Benson since the preparation of this paper. The two former of these towns were chiefly affected during August, and the last cases prior to these occurred about September 1st. The latter town is not in this valley.

able to secure accurate details of only one other examination of a lower animal, that of a horse that died, paralyzed in the hind legs. I am indebted to Dr. W. W. Townsend, of Rutland, for the following report of his examination of a section of the lumbar portion of the cord in this case: "The vertebral canal contained an amount of venous blood. Microscopically the appearances were as follows: *First*, gelatinous consistency; *Second*, yellowish color; *Third*, diffuse punctate hemorrhage. Microscopically on frozen section—granular degeneration and pigmentation of the ganglion cells in the anterior cornua and atrophy of the anterior nerve roots." Dr. Townsend tells me there was no meningitis in this case.

It has been remarked by many physicians that the usual diseases of children, during the past season, have been attended with exaggerated nervous symptoms. It is a source of great regret that in none of the fatal cases could an autopsy be procured, though extraordinary efforts were several times made to secure one.

In collecting statistics of this outbreak, I have sought only those cases attended with marked nervous phenomena, like muscular rigidity, special sense disturbance, or paralysis, and no disease by name, seeking not to prejudge the character of the disease or anticipate a diagnosis. Without detailing further individual cases, I have prepared a tabulated history of the epidemic as a whole, collecting the commonest features of the cases in my reported list of cases by themselves. I presume my list includes ninety per cent. of all the cases that have occurred.

TABLE 1.—AGE AND SEX.

Under six years	Male,	33	cases.
" "	Female,	16	"
" "	Not stated,	36	"
From 6 to 14 years	Male,	10	cases.
" "	Female,	2	"
" "	Not stated,	9	"
Over 14 years	Male,	8	cases.
" "	Female,	5	"
Stated "between a few months and 9 years."		7	"

Of the 119 cases in which the age is given, 85 are under six years, 21 between six and fourteen years, and 13 were over fourteen years. Of the latter, was one case seventy years of age. The genuineness of this case might at first be questioned, but the train of initial symptoms was the same as in the milder cases of childhood, with paralysis of both lower extremities, clearing up after ten days.

Of the 74 cases in which the sex was stated, 51 were males and 23 females.

TABLE 2.—NATIONALITY.

American	35
Irish-American	17
French	6
Jewish	1
Italian	1
Swede	1
Not stated	65

It has been noted that in the larger centres the races affected were oftenest foreign, while among the farming population, Americans predominated. It has not been entirely confined to any one class, but has been most prevalent among working people, and those whose sanitary surroundings were not of the best.

TABLE 3.—PREVIOUS HEALTH.

Good	41
Poor	10
Not stated	75

TABLE 4.—IMMEDIATE CAUSE.

Fatigue	2
Whooping-cough	1
Over-heating	22
Chilling body	4
Indigestion	2
Typhoid fever	2
Trauma	2
Pneumonia	2
No apparent cause or not stated	89

There has been but a single instance, so far as I can determine, in which there has been more than one case in a family, and since it has usually occurred in families of several children, I think it can be safely set down as non-contagious.

TABLE 5.—A.—INITIAL SYMPTOMS.

Temperature stated as above 103° F	27
Temperature stated as between 99° and 103° F	22
Said to have had no fever	3
Not stated	74

B.—Duration of Initial Fever.

Stated to be 1 day or less 4
" " " 1–2 days 2
" " " 2–3 " 6
" " " 3–4 " 7
" " " 4–7 " 26
" " " 7–14 4
No fever or not stated 77

C.—Nausea.

Stated to have had nausea or vomiting 25
" " " no nausea or vomiting 1

D.—Convulsions.

Stated to have had convulsions 12

All under 14 years.

E.—Bowels.

Stated to have been constipated 3
" " " had diarrhœa 3

F.—Bladder.

Stated to have had retention of urine 7
" " " " incontinence 1

G.

Stated to have had muscular rigidity of neck or back, or opisthotonos:

Fatal cases 5
Non-fatal 15

H.

Stated to have had hyperæsthesia of skin or soreness of muscles of the extremities:

Fatal cases 3
Non-fatal 24

I.—Special Senses.

Stated to have had strabismus	2
" " " " partial blindness	1
" " " " double vision	2
" " " " deafness	1

K.—Skin Eruptions.

Stated to have had a simple erythema	29
" " " " urticaria	2

Table 6.—Initial Paralysis.

No paralysis	6,	fully recovered,	5,	died,	1
Not determined	7,			"	7
Both legs	66,	"	"	43,	"	4
Arm and leg (same side)	9,	"	"	2,	"	1
One arm	5,	"	"	3.		
One leg	6,	"	"	1.		
Both legs and one arm	4					
Tongue and throat	2			died	1
Both arms	3					
All extremities	4			"	3
Extensors one thigh	1					
"Variously in arms and legs".	8	fully recovered,	1,	died,	1
External rectus one eye	1					
One side of face	1					
One arm and opposite leg	1					
All extremities and abdominal muscles	2					

TABLE 7.—PARALYSIS REMAINING AT TIME OF REPORT.

Glutei and lower spinal muscles of one side	1
Both legs	17
One leg	8
Both legs and one arm	3
Both arms	2
Arm and leg same side	6
Extensors one thigh	2
One arm	3
"Variously in arms and legs"	6
External rectus one eye	1
All extremities	2
One side of face	1
Extensors left thigh and right deltoid	1

It will be seen by these tables that six of these cases had no paralysis, as stated, but all of these had distinct rigidity of the spinal muscles, strabismus, or other symptoms referable to the nervous system, and are therefore included in this report. Of the seven cases reported as "not known" to have had paralysis, or in which nothing is said of any paralysis, all died with distinct symptoms of acute nervous disease, and may be fairly supposed to have died in the initial stage.

Of those that died it will be noticed that, beside the seven that succumbed early in the acute stage, four had paralysis of both lower extremities, three of all extremities, and one each had "no paralysis," "hemiplegia," "tongue and throat," and "variously paralyzed."

Of those who had recovered fully at the dates of the reports, which varied from two weeks to two months after the

attacks, five had no paralysis, forty-three had paralysis of both lower extremities, two of one arm and leg of same side, three of one arm, one of one leg.

While of the cases of which I have reports, fifty-three have still some paralysis at the time of the report, and it is probable that many of these are permanently disabled.

I am unable to make any statements based on statistics as to the number of cases in which there has been a wasting of the affected muscles, for the time is yet too short in most cases for marked wasting to have occurred. I hope later to be able to report on these wrecks of the epidemic.

The composite picture, presented by the facts I have enumerated, does not readily admit of a name. In seeking a classification of this epidemic under the present nomenclature of nervous disease, the features of the epidemic as a whole must be studied rather than those of isolated cases. Individual cases in this epidemic have been frequently diagnosed by the physician in attendance as poliomyelitis, but the outbreak as a whole presents marked variations from the text-book type of this disease. Opisthotonos, special sense symptoms, and hyperæsthesia are out of place in the long recognized phenomena of this disease, so that the epidemic as a whole presents notable departures from the established characteristics of poliomyelitis.

Again, cerebro-spinal, especially spinal meningitis is quickly seen in certain phases of this outbreak, but the season of the year, the general absence of special sense disturbance—particularly ear disease—the low mortality, the absence of purpuric eruption (stated by some as the most characteristic

diagnostic point in this disease as an epidemic) are strong arguments against this diagnosis.

That cerebro-spinal meningitis occurs as an epidemic has been known for many years. Such epidemics have occurred frequently during the present century in this country and in Europe. Several are recorded in Vermont.

Dr. Joseph Gallup, of Woodstock, states that in an epidemic in Vermont, in 1811, "even foxes seemed to be affected so that they were killed in numbers near the dwellings of the inhabitants." (Dr. Stille, in Pepper's Sys. of Med.) Most authors refer to the simultaneous attacking of domestic animals by this disease when it is epidemic. The epidemic character of the outbreak I am describing, therefore, suggests meningeal inflammation.

That poliomyelitis occurs in epidemic form is not so generally recognized, though recent text-books speak of such an occurrence. I am indebted to Dr. A. Jacobi and Dr. M. Allen Starr for the following notes of such epidemics: In the Trans. of the Tenth International Medical Congress (Boston, August, 1890,) Vol. II.—section of diseases of children—Prof. O. Medin reports that Dr. Bergenholtz, in Sweden, observed and reported thirteen cases of poliomyelitis occurring in his town (64° lat.) They were not published. G. Lotmer (Am. Jour. Med. Sciences, 1843,) was told by the parents of a child treated by him for poliomyelitis ("teething paralysis"), that in a place where they previously lived, eight or ten cases had been known within three or four months. Cordier gathered in 1886, notes of thirteen cases occurring near Lyons, France, four of which terminated fatally. Medin also cites Eichhorst, who speaks of the observations sometimes made of

several cases occurring in the same neighborhood. The Stockholm epidemic, reported by Medin, occurred in the summer of 1887.

The disease first appeared in the month of May, and by August 9th, assumed an epidemic character. From the latter date to September 23d, Medin saw twenty-nine cases, and knew of forty-four during the summer, from May to November. The cases reported by him, as a whole, resemble more nearly the typical cases of poliomyelitis than those in the Vermont epidemic. Three of his cases were fatal in the acute stage. "There were noticed, paralysis of the abducens in five cases, disturbance of speech in a few; in one case paralysis of the tongue, in several of the accessorius, and in others symptoms referable to the vagus. Disturbance of the voice and paralysis of the muscles of mastication, and vaso motor paralysis were seen in two fatal cases. In one, ophthalmoplegia externa. At the time of this Stockholm epidemic of poliomyelitis, during August and September, polineuritis appeared and was thought to be due to the same source. This neuritis was followed by considerable tenderness. In some cases twitching and tremor; also there was ataxia of movement during convalescence. These neuritis cases, however, showed no wasting. Medin considered infantile paralysis a specific infectious disease, in whose acute stage the entire organism is affected. Autopsies by Rissler support this theory. He found in the spinal cord an acute parenchymatous inflammation of the anterior horns, with degeneration of the ganglion cells and secondary degeneration of nerve-fibres in the association tracks, in the anterior columns, and in the anterior nerve-roots; also in the nuclei of the hypoglossus, vagus, facial, and abducens nerves. In most of the

cases, the anterior horns were particularly affected; in other cases also the peripheral nerves and brain cortex. It was possible that all the nerve nuclei in the medulla and pons should be affected."

It is generally recognized, I think, by all observers that poliomyelitis is a disease of the hot months, and that a large proportion of the cases are children ("infantile paralysis," "teething paralysis," etc.) Extreme heat has been considered a causal factor, or heat followed suddenly by a cold (Gowers.) None, so far as I have observed, speak of a coincident affection of the same nature in the lower animals. While poliomyelitis is seen to be occasionally epidemic, no such wholesale outbreak as the one of which I write, affecting the lower animals also, has yet been recorded.

In regard to the diagnosis in this outbreak, I am fortunate in being able to quote excellent authorities.

Dr. A. Jacobi, after a written description by me of this outbreak, was at first inclined to class it as an epidemic of meningitis. But after a more complete knowledge of the cases obtained from Dr. Starr, who had seen several, he writes: "It was particularly Dr. Starr's report of what he had seen personally that convinced me, some time ago, that I was wrong in the impression I gathered from the letters you kindly sent me last August. When he related all the symptoms he had noticed, I had no doubt as to the cases belonging to true poliomyelitis, such as it is understood to-day."

Dr. M. Allen Starr saw, in September, ten of these cases, at that time, of course, in the chronic stage of the disease. His conclusions in regard to the epidemic, which I am permitted to give, are: "The cases seen, if seen without a his-

tory, would have all impressed me as cases of acute anterior poliomyelitis, without a doubt. The history does not appear to me to contradict this diagnosis, and while in some respects unusual, viz., in eye paralysis, in stiff neck and pain, there is not as much difficulty in assigning them to anterior poliomyelitis as there is in assigning them to cerebro-spinal meningitis. Epidemics of anterior poliomyelitis are not unknown.

Dr. Charles L. Dana has also permitted me to quote his opinion of this epidemic. His knowledge of the outbreak was gained from my written statements to him, and from an examination of the cord and brain of a fowl sent him, which was suffering from paralysis of the legs and wings. His statement is as follows: "Dr. Dunham, of the Carnegie Laboratory, very kindly made a bacteriological examination of the cord and sciatic nerve of the fowl, but with negative results. Microscopic examination shows an acute poliomyelitis of the lumbar part of the cord, and no meningitis. Dr. Dunham's inoculating needle did not strike the affected part.

"Apart from the results of this case, which, of course, may have no relation to the epidemic, I feel the greatest possible confidence that the disease is in most cases a true anterior poliomyelitis."

Of course, the epidemic and apparently infectious character of the disease, points to a microbic origin. That epidemic poliomyelitis has such an origin is not a new hypothesis. Dr. Dana in an early letter to me, says: "Roger, Thornot and Masselin, Bourges and Vincent produced poliomyelitis in rabbits and guinea-pigs by inoculation of the coli bacilli, streptococus of erysipelas modified by culture."

In a recent letter Dr. Starr, further says that "There is now a tendency to revise the pathology of poliomyelitis," the regular descriptions of which are founded on Charcot's statements. Dr. Starr gives me the gist of an article published by Goldschreider in the *Zeitschrift fur klin, Med*, 1892, in which he says that his (Goldschreider's) conclusion, founded on a review of all the cases with autopsy, was that the disease began with a "very intense congestion of the central arteries of the spinal cord which come up on each side of the central canal, and spread out in the central gray matter and into the anterior horns. These arteries have branches passing backward into the gray matter of the posterior horns, but the posterior horns are chiefly supplied with blood from the peripheral arteries, and hence are less affected when the inflammatory condition is limited to the distribution of these central arteries. After the engorgement of all the arterial twigs, diapedis occurs and the surrounding nervous tissue is permeated by small cells and by serum. It is this choking of the gray matter by the inflammatory products which leads to the suspension of functional activity, and when, as in many cases from impoverished nutrition, the cells of the anterior horns are actually disintegrated by the inflammatory products, permanent destruction of the nerve tissue ensues.

Goldschreider believes, therefore, that the primary condition is a congestion in the domain of a definite set of arteries, quite comparable to the condition occurring in the lung in a pneumonia, and in the intestine in a typhoid fever.

Siemerling has also written a very careful article on the 'Pathology of Infantile Paralysis,' in the *Archiv fur Psychiatrie* for January, 1894. His conclusion is as follows: 'After

a careful review of all the literature, we reach, therefore, the following conclusion, that in the pathogenesis of infantile spinal paralysis, the inflammatory lesion of the interstitial tissue in connection with a distension of the blood vessels, especially in the region of the anterior spinal arteries, plays the chief *role*. A primary inflammation of the ganglion cells, in the sense given by Charcot, is not to be admitted.'"

Dr. Starr further says: "One more point. If you consult the descriptions given of congestion of the cord, you will find many of the general symptoms of pain, stiffness of the muscles, pain on movement, and general tenderness, which were present in the early stage of your epidemic. If now we grant that this newer pathology is correct, these symptoms are easily explained on the theory that the congestion and the inflammatory processes were, in your epidemic, not limited to the domain of the anterior spinal arteries, but extended to the posterior parts as well."

The quotations thus liberally taken from so competent authorities leave very little to be said in regard to the pathology or diagnosis of our disease. Admitting Dr. Starr's reasoning in regard to the congestion of the posterior as well as the anterior portions of the cord to be correct, supported by his citations from Goldschreider, Siemerling and Rissler, the phenomena of this epidemic can be reconciled with a diagnosis of poliomyelitis. The pain, hyperæsthesia, special sense disturbance, and muscular rigidity, the most important departures in our epidemic from the established symptoms of poliomyelitis, are rendered explainable under this newer pathology. A diagnosis of epidemic cerebro-spinal meningitis would certainly be more strained. The disease, cerebro-spinal meningitis,

in epidemic form, being more common, its symptoms and behavior are correspondingly better understood than poliomyelitis.

Gowers states that it has usually prevailed chiefly in winter and spring, ceasing about July. This seems to be very uniformly agreed to. Its features are discomfort, later pain in the head, backache, vomiting, stiffness of neck and back muscles. Pulse not uniformly rapid; temperature usually very high, 104° to 106° F. Eruptions, especially herpetic and purpuric, are common. Cranial nerve symptoms, and deafness and blindness as sequelæ, are the rule in a certain number of cases. Cases, and even epidemics, of an abortive form of this disease are not unknown. Gowers states that the mortality varies from twenty to eighty per cent. Hemiplegia, and in spinal cases, paraplegia, are occasionally sequelæ, but they are always attended by rigidity and contractures of the muscles. These are the long recognized features of epidemic cerebro-spinal meningitis. There must be admitted to be some marks of similarity between this description and our epidemic. The almost universal paralysis in our cases and its irregular and varied character, are entirely foreign to the generally described features of cerebro-spinal meningitis. Likewise, too, the season of the year, the general absence of eye and ear impairment, and of herpetic and purpuric eruptions, the low mortality and the absence of contractures.

The Vermont epidemic, the details of which I have given with as much completeness as they could be secured from busy practitioners, is so exceptional as respects the number of cases as well as the great variety of the phenomena, as make one hesitate to assign it unqualifiedly to either of the diseases men-

tioned. The facts presented by my collection of statistics—obtained, as before stated, without regard to the ultimate diagnosis—point at first thought to both diseases. That there was a double or coincident epidemic here of poliomyelitis and cerebro-spinal meningitis was at first the opinion of some local observers. In view of the facts detailed in regard to recorded epidemics of poliomyelitis and the recent views respecting its pathology, which I have mentioned, the conclusion that this has not been an epidemic of two, but of one disease, seems not only reasonable but very certain.

I need not say that it is largely through the kindness of Drs. Jacobi, Starr, and Dana, whose assistance in compiling this paper is gratefully acknowledged, that I feel warranted in thus classifying this epidemic.

In conclusion, let me acknowledge the uniform courtesy with which the practitioners of Rutland County have responded to my requests for statistics of this outbreak. The list includes nearly all the practicing physicians of this county. Comparatively few of the cases have fallen under my direct observation, and without their aid it would obviously have been impossible to make any record of this unparalleled epidemic approaching completeness.

DISCUSSION.

Dr. H. L. Newell. *Mr. President and Gentlemen*: I did not expect to be called upon until a moment ago, Dr. Caverly said I would be called upon to open the discussion.

I have been very much interested in this paper and very much interested in the epidemic which this paper describes. I think Dr. Caverly has given us a very full and interesting account of it and there is very little for me to say.

I have seen quite a number of cases—I think nineteen I reported, did I not Doctor?—in all—nineteen cases I believe I have seen and reported. Two of these proved fatal and perhaps I will say just a word in regard to these two cases. One of them was complicated by a severe cold, more severe than most of them had to begin with. The majority of the cases gave indications of some slight catarrhal cold in the commencement of the disease before any fever developed—according to the history given by the parents. The other case was complicated by cholera infantum. In this case I saw the child on Sunday and it had an attack of indigestion to all appearances, slight fever, vomiting and diarrhœa, I prescribed for the child and the next day I was sent word that the child was better and I would not have to see it. The next day, Tuesday, being at the next neighbors, the mother called me in. The child had some fever and little diarrhœa. I left some medicine with directions that if the child did not gain to let me know. I heard nothing more about the case until a week after that, but the next Tuesday I was called in haste and found the child in a collapse and apparently dying. I put it in a hot bath and the child revived a little but had convulsions and lived but twenty-four hours.

They gave the history of this period in which I did not see the child, that the child was apparently gaining all right and was about the house, running around, the child was about two years of age, and the day before it was taken worse, Monday, it sat at the table and ate dinner and had a good appetite and was apparently doing well, so you see how they were taken. This child had paralysis before it died, paralysis of the lower extremities and severe convulsions. The other case had paralysis of the lower extremities.

In all the other cases, seventeen, they are all recovering the use of their limbs and all of them running about, although some of them make quite a halt in one limb. This is the condition in all but one case, and that is of too recent origin to show what the result will be.

So far, I have noticed no muscular atrophy and have noticed so far no spinal curvature. There may develop these symptoms later. In almost all cases, with but three or four exceptions, I believe there was diarrhœa and vomiting at the outset. The discharges from the bowels were in almost every case very dark, black, tary, in the early stages.

In the majority of cases which I have had, I feel sure that the paralysis did not come on until after the acute symptoms had almost subsided and the child was apparently doing well and running about the house, and in the period of about ten days or two weeks, paralysis developed; and the paralytic symptoms in most every case lasted only about three days, some of them only a little over fourteen hours.

I do not know as I have anything further to add. I feel very much interested to have the question solved as to whether it is a bacterial disease or not.

Dr. G. B. Nichols: I would like to ask these gentlemen if they ascertained the amount of urine passed in these cases?

Dr. Caverly: In the cases that I saw myself, I do not remember that it was ever measured, and as I remember I have notes of only one case in which the urine was tested at all accurately. I do not think there was anything referable to the water or to the kidneys.

Dr. Newell: In quite a number of cases I examined the urine. I found the specific gravity to be something like

1025-26.7 in the acute stages, and urine of high color and rather scanty, but not any more so than we would usually find in febrile conditions. Afterwards I found an increased amount of phosphates and a large deposit of urea in some instances and the quantity would increase in amount.

Most of the cases which I had, were as a rule, too young to get the urine readily. I think I had one case over six years old and none younger than two or very near that.

Dr. J. N. Jenne: *Mr. President and Gentlemen*: I wish to express my appreciation to Dr. Caverly for his very excellent paper on this disease, and to Dr. Newell for his discussion of the same. I shall not attempt to add to it but in connection with the subject there is one point I would raise. I wish to make the inquiry of Dr. Caverly, whether in such cases, the paralysis of the extremities—in such cases as did not make a complete recovery after fever—if it involved a certain muscle or whether the whole limb was paralyzed, or seemingly paralized?

Dr. Caverly: I am very glad Dr. Jenne has spoken of that. There are perhaps a dozen cases that I have personally examined after a sufficient length of time for the bulk of the paralysis to clear up, and in most of these, I am not able to say how many, but in two or three the wasting was confined to a very limited group of muscles.

There was one case which I had in which the whole of one leg was paralyzed that cleared up in a month or six weeks except a group of muscles on the outside near the ankle, so the ankle was weak and the girl has trouble in walking or in going up stairs. And another case, the most interesting of the whole lot, was the case I spoke of with paralysis of the right

arm and left leg. That has all cleared up except some slight trouble with the thigh and arm. The child cannot raise the arm like that (indicating) and cannot push upwards; otherwise is entirely well. I think that in the other cases the paralysis with the aid of electricity can be traced down to a very limited group of muscles.

Dr. Geo. B. Nichols: *Mr. President and Gentlemen*: I wish to say one word in regard to brother Caverly's paper and that is this: It seems from the description that he gives, that one of the important features that he gives with these cases is almost the entire suppression of the urine; in others it is considerably diminished.

The point might come in here whether or not during the chills which one of these patients took that the uric acid was driven back into the tissues. Now we understand well that in children we get a great many more nervous complications than in adults. It is not uncommon to see children have convulsions as a preliminary to pneumonia where an adult would seem to suffer only from a severe chill. We cannot locate where this uric acid will be driven. It may take its location somewhere in the brain tissue, or in the alimentary canal, it may go to the spinal column, attack the anterior column or it may go to the membranes.

Now it seems that in his cases that so far as the indications he can give, the uric acid took up its location in the spinal column. I wish they could have examined a little more closely the urine and stated the exact amount, and gone further and examined the amount of uric acid passed. I think if he could have done so he would have found that uric acid was a very important feature in this epidemic, as it may be termed.

IN MEMORIAM

John Avery,.....Wallingford.
E. M. Shurtleff, ...Proctorsville.

CONSTITUTION AND BY-LAWS

OF THE

Vermont State Medical Society

(As revised October 1892, and amended October 1895.)

CONSTITUTION.

ARTICLE I.—NAME.

This Society shall be called the Vermont State Medical Society.

ARTICLE II.—OFFICERS.

The officers of this Society shall be a President, Vice-President, Secretary, Treasurer, Auditor, Publication Committee of three members, of which the Secretary shall be chairman, Executive Committee of three members, of which the Secretary shall be one *ex-officio*, a Committee on Necrology of three members. a Committee on Membership of three members, and a Board of License Censors, consisting of three members, all of whom shall be elected annually at the opening of the second day's session, by ballot when demanded by any member present, or in such other manner as the Society shall direct, except the Committee on Membership, which shall be elected at the morning session of the first day, and shall hold their respective offices until the close of the next annual meeting, and until others are chosen.

ARTICLE III.—MEETING.

There shall be an annual meeting of this Society held on the first Thursday and Friday after the second Wednesday in October, at such place as shall be designated by vote, at the previous annual meeting.

ARTICLE IV.—Membership.

Any physician residing within the State, who is a graduate of a regular recognized Medical School, may become a member of this Society at any regular meeting, upon recommendation of the Board of Councillors and vote of the Society, by signing the constitution and paying the sum of two dollars to the Treasurer.

ARTICLE V.—Discipline.

Any member of the Society guilty of intoxication, unprofessional or irregular practice, or of gross immorality, or for other good reasons, may be expelled or suspended from the Society by a vote of two-thirds of the members present at any annual meeting.

ARTICLE VI.

This Constitution may be repealed, altered or amended at any annual meeting, by a vote of two-thirds of the members present, provided such repeal, alteration or amendment be proposed at a previous annual meeting.

ARTICLE VII.

This Society may adopt such By-Laws, not repugnant to this Constitution, and may repeal, alter or amend the same, in such manner as a majority at any annual meeting may deem proper.

BY-LAWS.

ARTICLE I.—Duties of Officers.

Sec. 1. The President shall preside at all meetings and perform all the duties incident to such office. He shall deliver, or cause to be read, an address or dissertation on some medical subject at the annual meeting at which he presides.

Sec. 2. The Vice-President shall preside in the absence of the President, and perform all his duties and possess all his privileges. He shall deliver, or cause to be read, at the opening of the afternoon session, of the first day, of the annual meeting, an address on medicine or surgery.

Sec. 3. The Secretary shall keep a record of the proceedings of the Society, and of the members present at each meeting; shall arrange and publish the programme at least two weeks before each meeting; shall conduct the correspondence, shall procure a stenographer to report the proceedings of each meeting; and shall have his necessary expenses defrayed from the funds of the Society. He shall, if unable to attend the meeting of the Society, personally, send the records to some member in attendance. He shall receive an annual salary of fifty dollars.

Sec. 4. The Treasurer shall collect and disburse all monies of the Society, agreeable to their directions, and make report of his doings to the Society at its annual meeting.

Sec. 5. The Auditor shall examine and verify the accounts of the various officers.

Sec. 6. The Executive Committee shall make selection of a subject or subjects for the programme, and appoint a committee of arrangements of three members, for the next ensuing meeting; shall

make assignments of the parts to any of the members, as in their judgment they think advisable, and report the same to this meeting and to each and every subsequent meeting.

They shall make such other arrangements for the meetings of the Society, as they shall deem essential for its best interests.

SEC. 7. The Committee of Arrangements shall be residents of the town where the meeting is to be held. They shall make arrangements for the place of meeting, for a banquet on the evening of the first day, and for space for medical and surgical exhibits and such other local arrangements as they may deem essential for the success of the meeting.

SEC. 8. The Publication Committee shall receive all papers referred to them by the Society, and as soon as possible subsequently to the annual meeting of the Society, shall publish such of those papers as they may deem best suited to promote the interests of the profession and the public good, under the title, Transactions, and perform all other appropriate duties.

SEC. 9. The duties of the Committee on Membership shall be to examine the credentials and qualifications, with reference to their method of practice, etc., of persons desirous of becoming members of the Society, and present at each meeting the names of such as, in their opinion, are eligible to Membership under the Constitution and Regulations of the Society. They shall recommend for membership, only such physicians as shall present to them their diplomas, or a certificate in writing signed by some member of the Society, in good standing, stating that he has personal knowledge that said applicant has a diploma from a regular recognized medical school.

SEC. 10. The Committee on Necrology shall report the names of deceased members, and shall cause to be prepared such brief biographies as may in each case be deemed best.

SEC. 11. It shall be the duty of the Board of License Censors to issue license certificates to regular physicians wishing to practice medicine in this State, in accordance with the State law regulating such practice.

ARTICLE II.—Dues.

Sec. 1. Every member of this Society (honorary excepted) shall pay to the Treasurer an annual fee of two dollars.

Sec. 2. Any member who shall fail to pay his dues for a period of three years, shall be dropped from the Society, and his name stricken from the roll of membership, and he shall be so notified by the Treasurer.

Sec. 3. Any member who has been dropped from the Society for non-payment of dues may be reinstated by paying all arrears or re-elected after any number of years by a vote of three-fourths of the members present at any regular meeting, upon payment of the three years' arrearages.

ARTICLE III.—Honorary Members.

The Society may elect at each annual meeting, not more than two honorary members, non-residents of the State, who shall have the same privileges as ordinary members, except that they shall not be eligible to office, nor have the right to vote.

ARTICLE IV.—Delegates.

Delegates shall be appointed annually to represent this Society in the American Medical Association; the Medical Department of the University of Vermont, and of Dartmouth College at the examination of candidates for graduation, and credentials shall be issued to such delegates by the Secretary when he is duly notified of the time and place of such examinations; the Connecticut River Valley Medical Society; the White Mountain Medical Association; the White River Valley Medical Association; the Northern New York Medical Association; the State Medical Societies of the New England States together with those of New York, and such other States and Societies as the mutual interests of the societies may direct.

In cases where delegates are unable to attend to the duties of their appointment, it shall be their duty to notify the Secretary, of such inability, and the Secretary and President shall appoint others to supply their places.

ARTICLE V.

One member of the Society shall be appointed by the Secretary to open the discussion on each paper to be presented at any meeting.

ARTICLE VI.

Any member wishing to withdraw from the Society shall be permitted to do so on his written request after he shall have presented the Treasurer's receipt for all monies due.

ARTICLE VII.

The Constitution and By-Laws, together with the names and residences of the members in good standing shall be published in every volume of the Transactions.

ARTICLE VIII.

The names of the deceased members of the Society, with the dates of birth, graduation, admission to membership, death and such other items in brief, of personal history, as may seem desirable to the Committee on publications, shall be printed in each copy of the Transactions under the caption, "In Memoriam."

LIST OF MEMBERS.

Albee, E. S. ..... Bellows Falls
Allen, J. M. ..... St. Johnsbury
Allen, C. E. ..... Swanton
Allen, S. J. ..... White River Junction
Andrews, B. J. ..... Burlington
*Avery, John ..... Wallingford
Bailey, A. C. ..... West Randolph
Baker, O. C. ..... Brandon
Barrows, H. W. ..... Stowe
Baxter, E. K. ..... Sharon
Belden, Geo. W. ..... Jericho
Bingham, A. L. ..... Williston
Bingham, L. M. ..... Burlington
Bisbee, A. B. ..... Montpelier
Blake, W. C. ..... Lyndon
Boynton, Henry ..... Woodstock
Branch, C. F. ..... Newport
Brewster, J. D. ..... Windsor
Brigham, C. W. ..... Rutland
Brigham, C. O. ..... Rutland
Brigham, F. L. ..... Pittsford
Brooks, S. T. ..... St. Johnsbury
Brown, E. M. ..... Sheldon
Bugbee, A. G. ..... Derby Line

*Deceased.

Bullard, G. B. ..... St. Johnsbury
Burnette, D. L. ..... South Royalton
Bushnell, E. H. ..... Jeffersonville
Camp, C. F. ..... Barre
Carpenter, F. W. ..... West Rupert
Campbell, E. R. ..... Bellows Falls
Caverly, C. S. ..... Rutland
Chaffee, F. F. ..... Hartford
Chase, R. M. ..... Bethel
Chandler, C. E. ..... Montpelier
Chandler, M. L. ..... Barre
Church, W. G. ..... Stowe
Comings, F. W. ..... North Troy
Cooty, Thomas A. ..... Mount Holly
Claflin, A. A. ..... St. Albans
Clarke, J. M. ..... Burlington
Crain, M. R. ..... Rutland
Crandall, H. A. ..... Burlington
Cramton, H. A. ..... St. Johnsbury
Cummings, Wm. L. ..... Rutland
Darling, S. E. ..... Hardwick
Darrah, A. J. ..... Enosburgh Falls
Davenport, G. E. ..... East Randolph
Davenport Geo. ..... East Randolph
Davis, B. W. ..... Montgomery
Draper, C. R. ..... St. Albans
Dunsmore, Geo. ..... St. Albans
Dyer, O. G. ..... Brandon
Eddy, M. H. ..... Middlebury
Edmunds, G. F. ..... Bristol

Erwin, C. L. ..... Newport Centre
Fairman, E. P. ..... Hardwick
Ferrin, C. M. ..... Essex Junction
Foster, Geo. S. ..... Putney
Flanders, W. G. E. ..... Burlington
Fowler, I. N. ..... Groton
Fox, Geo. H. ..... Rutland
Francisco, H. A. ..... Rutland
Gale, F. L. ..... Barre
Gartland, T. F. ..... White River Junction
Gay, L. C. ..... Brownsville
Goodall, F. W. ..... Bennington
Goodrich, V. A. ..... Brookfield
Gorham, George H. ..... Bellows Falls
Gray, F. S. ..... Troy
Graves, L. K. ..... Waterbury
Green, O. D. ..... Warren
Green, L. M. ..... Bethel
Grinnell, A. P. ..... Burlington
Griswold, S. H. ..... Rutland
Hamilton, J. H. ..... Richford
Hanrahan, J. D. ..... Rutland
Havens, W. L. ..... Chester Depot
Hawley, D. C. ..... Burlington
Hawley, C. F. ..... Fairfax
Hazelton, D. W. ..... Springfield
Heath, W. E. ..... Richmond
Holton, H. D. ..... Brattleboro
Hooker, E. G. ..... Waterbury
Howe, H. T. J. ..... Waitsfield

Howard, J. A. ..... Alburgh Springs
Hubbard, L. W. ..... Lyndon
Hulbard, Geo. B. ..... Jericho
Huntington, W. M. ..... Rochester
Huntington, W. D. ..... Rochester
Hutchinson, Wm. R. ..... Enosburgh Falls
Hunt, C. N. ..... Montpelier
Hyde, G. B. ..... St. Albans
Hyde, W. B. ..... Bakersfield
Jackson, J. H. ..... Barre
Jackson, Jos. W. ..... Barre
Jackson, H. N. ..... Brattleboro
Janes, Henry ..... Waterbury
Jenne, J. N. ..... St. Albans
Johnson, R. T. ..... West Concord
Keenan, J. C. ..... Rutland
Kemp, D. G. ..... Montpelier
Kidder, F. T. ..... Woodstock
Kinney, F. C. ..... Greensboro
Locke, C. W. ..... Grafton
Lane, G. E. ..... Ludlow
Linsley, J. H. ..... Burlington
Lindsay, W. ..... Georgia
Lee, H. H. ..... Wells River
Lawton, S. E. ..... Brattleboro
Lazell, W. E. ..... Plainfield
Lance, A. J. ..... Worcester
Marshall, G. G. ..... Rutland
McSweeney, P. E. ..... Burlington
Miller, A. I. ..... Brattleboro

Morgan, F. C. ..... Felchville
Moody, A. E. ..... Isle La Motte
Mack, E. B. ..... Olcutt
McSweeney, J. E. ..... Barre
Martin, E. H. ..... Middlebury
Manchester, H. S. ..... Pawlet
Miner, A. L. ..... Weston
Morse, F. J. ..... Royalton
Nay, W. S. ..... Underhill
Newton, Chas. P. ..... Underhill
Newton, George H. ..... Irasburg
Newell, H. L. ..... Proctor
Nichols, Geo. B. ..... Barre
Osgood, F. L. ..... Townshend
Perkins, O. H. ..... Worcester
Prime, M. F. ..... Barton
Prime, W. R. ..... Burlington
Peck, O. W. ..... Winooski
Peck, C. W. ..... Brandon
Porter, Edwin ..... Northfield
Perry, C. C. ..... West Rutland
Paige, S. W. ..... St. Albans
Pettingill, O. H. ..... Saxton River
Pratt, C. S. ..... Brattleboro
Petty, C. W. ..... Keeler's Bay, South Hero
Pelton, R. M. ..... Richford
Pond, E. M. ..... Rutland
Page, Fred C. ..... Johnson
Richmond, J. S. ..... Windsor
Rugg, D. F. ..... Hartland

Rogers, Lyman ..... Bennington
Rustedt, Geo. ..... Rutland
Ray, C. W. ..... Jamaica
Russell, C. J. ..... Hinesburgh
Robertson, F. D. ..... St. Albans
Rutherford, J. C. ..... Newport
Reid, W. D. ..... Barre
Ross, E. H. ..... St. Johnsbury
Ross, C. B. ..... West Rutland
Reilly, J. H. ..... Rutland
Rich, F. A. ..... Burlington
Smith, C. C. ..... Gaysville
Skinner, R. B. ..... Barton
Sperry, C. A. ..... Quechee
Scott, C. A. ..... Plymouth
Sherwood, R. ..... St. Albans
Swift, H. H. ..... Pittsford
Sherwin, O. W. ..... Woodstock
Stoddard, F. R. ..... Shelburne
Strobell, C. W. ..... Rutland
Sears, F. W. ..... South Hero
Shipman, E. W. ..... Vergennes
Stoddard, R. O. ..... New Haven
Senton, B. C. ..... Rutland
Styles, W. W. ..... Essex
Stevens, S. E. ..... Hartland
Staples, Hall ..... Grafton
Spafford, Geo. ..... Cavendish
Tinkham, H. C. ..... Burlington
Thompson, J. E. ..... Rutland

Trull, E. V. ..... Manchester
Tanner, J. D. ..... Winooski
Upham, E. F. ..... West Randolph
Vincent, W. H. ..... Orwell
Varney, W. H. H. ..... Charlotte
Woodward, J. H. ..... Burlington
Woodward, A. T. ..... Brandon
Worthen, H. O. ..... Barre
Wiswell, S. L. ..... Cabot
Wilder, H. R. ..... Swanton
Willard, A. J. ..... Burlington
Wheeler, J .B. ..... Burlington
White, P. P. ..... Williamsville
Warren, M. D. ..... Cabot
Watson, E. B. ..... Williamstown
Woodhull, J. B. ..... South Shaftsbury
Weston, E. S. ..... Newfane
Whipple, F. E. ..... Danby
Watkins, H. R. ..... Burlington

HONORARY MEMBERS.

		ELECTED.
Crothers, T. D.	Hartford, Conn.	1892
Douglas, O. B.	New York, N. Y.	1891
Field, A. E.	Barre, Vt.	1890
Frost, C. P.	Hanover, N. H.	1886
Irish, J. C.	Lowell, Mass.	1894
Kellogg, D. S.	Plattsburgh, N. Y.	1892
Lyon, E. M.	Plattsburgh, N. Y.	1892
Ransom, J. B.	Dannamora, N. Y.	1889
Shattuck, Frederic C.	Boston, Mass.	1894
Watson, H. P.	Haverhill, N. H.	1887

*Deceased.

Society founded in 1814.

LIST OF PRESIDENTS

Since 1851.

		Elected
Goldsmith, M.	Rutland	1851
Palmer, B. R.	Woodstock,	1852
Thayer, S. W. Jr.	Northfield,	1853
Warner, E. D.	New Haven,	1854
Perkins, Joseph,	Castleton,	1855
Carpenter, Walter	Randolph,	1856
Stevens, H. F.	St. Albans,	1857
Allen, C. L.	Middlebury,	1858
Knights, A. E.	Springfield,	1859
Morgan, B. F.	Bennington,	1860
Woodward, A. T.	Brandon,	1861
Stiles, J. N.	Windsor,	1862
Bradford, P. D.	Northfield,	1863
Fassett, O. F.	St. Albans,	1864
McCollom, Wm.	Woodstock,	1865
Warner, E. D.	New Haven,	1866
Frost, C. P.	Brattleboro,	1867
Richmond, J. S.	Woodstock,	1868
Janes, Henry	Waterbury,	1869
Putnam, S.	Montpelier,	1870
Upham, E. F.	West Randolph,	1871
Holton, H. D.	Brattleboro,	1872

		Elected
Butler, L. C.	Essex,	1873
"	"	1874
"	"	1875
Dunsmore, Geo.	St. Albans,	1876
Chandler, C. M.	Montpelier,	1877
Bullard, G. B,	St. Johnsbury,	1878
Thayer, S. W.	Burlington,	1879
Jackson, J. Henry	Barre,	1880
Sherwin, O. W.	Woodstock,	1881
Bingham, L. M.	Burlington,	1882
Clark, S. S.	St. Albans,	1883
Draper, Joseph	Brattleboro,	1884
Kemp, D. G.	Montpelier,	1885
Brooks, S. T.	St. Johnsbury,	1886
Campbell, Edw. R.	Bellows Falls,	1887
Clarke, J. M.	Burlington,	1888
Brown, H. S.	St. Johnsbury,	1889
Jenne, J. N.	St. Albans,	1890
Caverly, C. S.	Rutland,	1891
Wilder, H. R.	Swanton,	1892
Bisbee, A. B.	Montpelier,	1893
Linsley, J. H.	Burlington,	1894

MEDICAL LAWS OF VERMONT.

PRACTICE OF MEDICINE AND SURGERY, CHAPTER 172, REVISED LAWS 1880.

SECTION 3908. Medical societies, organized under a charter from the general assembly shall at each annual session, elect a board of censors, consisting of three members, who shall hold their office till others are elected; which board may examine and license practitioners of medicine, surgery and midwifery.

3909. A practitioner of medicine, surgery or midwifery, who, by sign or advertisement, offers his services to the public as practitioner of either medicine, surgery or midwifery, or who, by such sign or advertisement, assumes the title of doctor, shall obtain a certificate from one of such medical societies, either from a county, district or State society.

3910. A person not a resident of this State, who has not received a diploma from a chartered medical college, shall obtain a certificate from a board of censors in this State before he shall be permitted to practice the medical art in this State.

3911. Each board of censors shall issue certificates, without fee, to physicians and surgeons who furnish evidence, by diploma from a medical college or university, or by certificate of examination from an authorized board, which satisfies said censors that the person presenting such credentials has been, after due examination, deemed qualified to practice the branches mentioned in such diploma or certificate.

3912. The censors of each medical society aforesaid shall, in their discretion, notify practitioners of medicine,

surgery or midwifery of the terms of this chapter, and shall require such persons to comply therewith within thirty days after such notification, or within such further time as is allowed by the censors, not exceeding ninety days.

3913. The certificate shall set forth that said censors have found the person to whom it is given qualified to practice the branches of medical art mentioned in it, and shall be substantially in the following form:

No.—· *Certificate.*

STATE OF VERMONT, } ss
COUNTY OF——. }

This may certify that the undersigned board of censors have found A. B., of———, in the county of———, and State of———, qualified in the following branches of the medical profession: ————————; and therefore license him to practice said branches within this State.

_____
_____
_____

Board of Censors of Medical Society.

3916. *Penalty.* A person who practices medicine, surgery or midwifery in the State, or signs a certificate of death for purposes of burial or removal, unless authorized so to do, by a certificate and recorded as provided, shall for the first offense be fined not less than fifty, nor more than two hundred dollars, and for a subsequent offense, not less than two hundred, nor more than five hundred dollars, which fine may be recovered in an action of debt for the use of any person who sues therefor or by an indictment.

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Vermont State Medical Society
Transactions, 1894.

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